DSM300

Digital Sounder Module

Operation with hsb^2
PLUS Series Displays

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Preface

Purpose

Raymarine DSM300 Digital Sounder Modules provide echo sounder data that can be displayed on Raymarine E Series, C Series, and hsb^2 PLUS (Pathfinder) Series display units. This handbook describes operating the DSM300 with hsb^2 PLUS Series displays. Instructions for using the DSM300 with E Series and C Series displays are available in the handbooks for those products. The DSM300 will not work with older HSB (non-PLUS) displays.

DSM300 Digital Sounder Modules are intended for recreational depth finding and fishfinding purposes. Echo sounder systems require an appropriate Raymarine transducer unit and inter-connecting cable.

To obtain the best results in DSM300 operation and performance, please read this handbook thoroughly. Raymarine's Technical Services representatives or your local dealer will be available to answer any questions you may have.

SAFETY NOTICE

This equipment must be installed and operated in accordance with the instructions contained in this manual. Failure to do so can result in personal injury and/or navigational inaccuracies. In particular:

CAUTION: High Voltage

The DSM300 contains high voltages. Adjustments require specialized service procedures and tools only available to qualified service technicians – there are no user serviceable parts or adjustments. The operator should never remove the cover or attempt to service the equipment.

CAUTION: Transducer Cable

Removing the transducer cable from the rear of the DSM300 while the sounder module is powered on can cause sparks. Only remove the transducer cable after power has been removed from the DSM300. As with any electronic device, be sure the sounder module is mounted where it is well ventilated and free from gasoline fumes.

If the transducer cable is accidentally removed while the DSM300 is powered on, remove power from the sounder module, replace the transducer cable, and then return power to the module. As a safety feature, the DSM300 only recognizes that the transducer is connected at power-up.

EMC Conformance

All Raymarine equipment and accessories are designed to the best industry standards for use in the recreational marine environment.

The design and manufacture of Raymarine equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) standards, but correct installation is required to ensure that performance is not compromised.

Conventions

Throughout this handbook, the dedicated (labelled) keys are shown in bold capitals; for example, **ENTER**. The soft key functions, menu names and options are shown in normal capitals; for example, SCREEN.

Operating procedures, which may consist of a single key-press or a sequence of numbered steps, are indicated by a ➤ symbol in the margin. When the procedure requires you to press a soft key, the soft key icon is shown in the margin.

Technical Accuracy

To the best of our knowledge, the technical and graphical information contained in this handbook was correct as it went to press. However, the Raymarine policy of continuous improvement and updating may change product specifications without prior notice. As a result, unavoidable differences between the product and handbook may occur from time to time, for which liability cannot be accepted by Raymarine.

Chapter 1: Overview

1.1 Introduction

This handbook describes how to operate the DSM300 Digital Sounder Module with hsb^2 PLUS (Pathfinder) Series displays. The DSM300 emits and receives sonar signals from a transducer mounted in the water, then interprets and transmits the data to a separate hsb^2 PLUS (Pathfinder) Series display unit installed in your boat.

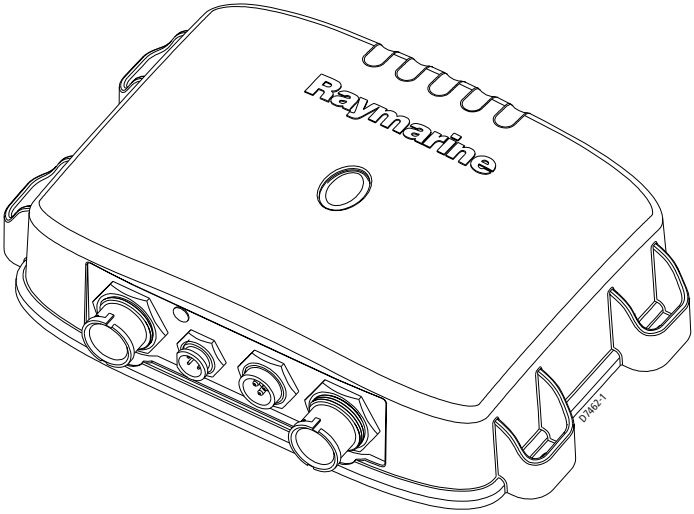


Figure 1-1: DSM300 Digital Sounder Module

The DSM300 employs a very high transmission repetition or "ping" rate which, along with the digital adaptive high sample rate receiver, ensures that fish and bottom structure are presented in superb detail and optimal color allocation. The DSM300 digital bandwidth adaptation adjusts the receiver band width dynamically from very wide to very narrow, as required by the actual water conditions. This provides superior fish and bottom detection in all surroundings.

The DSM300 features dual frequency (200 kHz and 50 kHz) operation and—depending on the transducer installed and conditions—up to 1000 watts RMS output power and performance from 3 ft (1m) up to 5000 ft (1700 m).

Note: *Many illustrations in this handbook show example screens. The screen you see on your display depends on your system configuration and set up options, so it may differ from the illustration.*

General

The DSM300 system is comprised of the Digital Sounder Module, hsb^2 PLUS (Pathfinder) Series display unit, transducer, and associated cables.

The DSM300 module is waterproof to IPX7 and can be installed either above or below deck.

The unit includes connections to:

- power
- the transducer
- hsb^2 PLUS (Pathfinder) Series or C Series display unit
- E Series display unit

1.2 Fishfinder (Sonar) Mode Display Features

When connected to a display unit and switched to Fishfinder (Sonar) mode, the following data can be viewed:

- Depth, speed and temperature, if the transducer is so equipped
- Single or split frequency sonar display: 50 kHz, 200 kHz
- Display options: zoom, bottom lock and A-Scope
- Windows to display additional data. (Position data requires GPS.)

1.3 How to Use this Handbook

This handbook describes how to operate a DSM300 with your hsb^2 PLUS (Pathfinder) Series display unit. Instructions for operating the DSM300 with C Series or E Series displays are available in the handbooks for those products.

Chapter 2 shows how to start using the hsb^2 PLUS (Pathfinder) Series display and viewing sonar echo data.

Chapter 3 provides instructions for setting up your PLUS Series display system to suit your preferences. You should read this chapter to determine how to change the sonar system from the default settings.

Chapter 4 details operating the PLUS Series display unit's controls in Sonar mode.

Chapter 5 provides information for operating sonar functions using the PLUS Series display: selecting depth range limits, adjusting gain, color and STC, setting alarms, using the VRM marker, marks and man overboard.

Appendix A lists abbreviations used in this handbook.

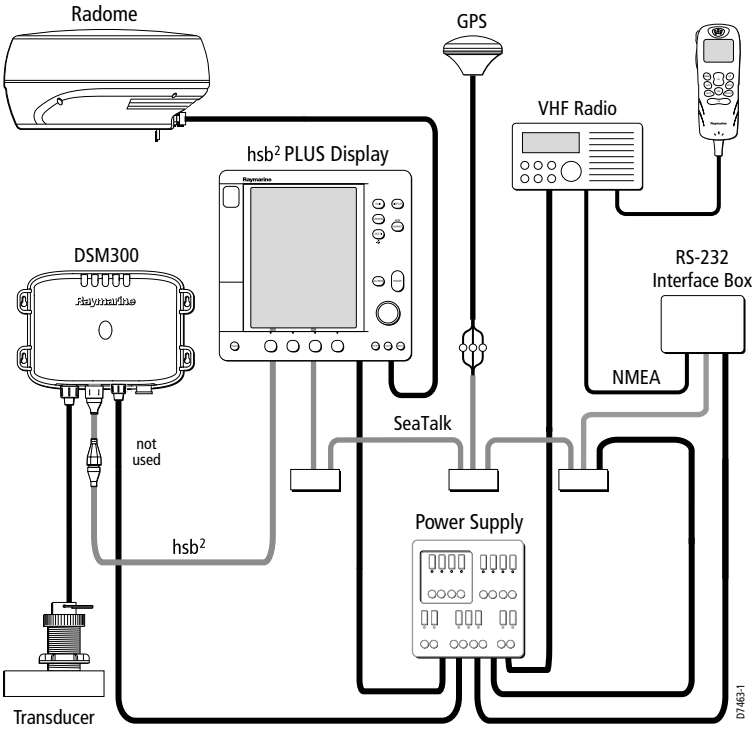


Figure 1-2: DSM300 in an Integrated System

Chapter 2: Getting Started

2.1 Introduction

This chapter provides basic instructions to get you started using the DSM300 Digital Sounder Module with a Raymarine hsb^2 PLUS (Pathfinder) Series display. Instructions for operating the DSM300 with a C Series or E Series display are available in the handbooks for those products.

This chapter also describes Simulator mode and helps you to become familiar with the basic functions of the display's controls in Sonar operation mode. More detailed information on using the controls and operating in Sonar mode is provided in Chapter 4 and Chapter 5, respectively.

Note: *All settings described in this chapter are retained when the unit is powered off. However, there is a one-minute delay from the time you make the setting change to when the DSM300 places it in memory. If you power down the sounder less than one minute after making a change, the setting is lost.*

2.2 Powering on the Sounder Module

There is no power switch on the DSM300. The unit turns on when the power cord is attached to boat's power and plugged into the POWER connector on the connector panel.

CAUTION:
The DSM300 should be located so that the power cord can be easily removed, if necessary. If the sounder is placed in a difficult-to-reach location, Raymarine strongly suggests installing a power switch on the DSM300 power cord at a point where it is easily accessible.

Status LED

The LED on the front panel blinks green when the module is powered on and operating normally. If the unit detects a problem, the LED blinks amber to indicate a warning or red for an error. The number of times the LED blinks is a code representing the nature of the problem. For an explanation of the various error codes, refer to the DSM300 Installation Manual.

2.3 Selecting Sonar Mode

If properly connected to an hsb² PLUS Series Radar, Chartplotter or Fishfinder display unit, you can begin viewing echo sounder data by setting the display to Sonar mode.

Note: *Data, such as depth, speed, temperature, log, and trip are still available even if Sonar mode is not selected.*

DISPLAY

➤ To set the mode, press the **DISPLAY** key to show the DISPLAY pop-up, then press again to cycle through the modes available, shown in Figure 2-1.

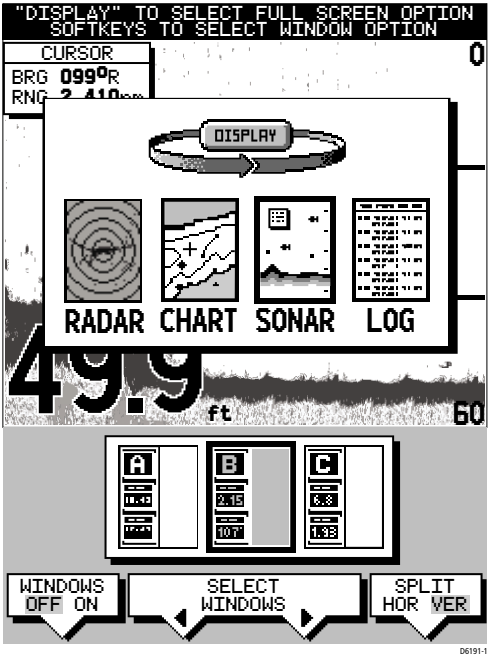


Figure 2-1: Using the DISPLAY Key

The selected mode is shown by an icon with a black (monochrome display) or red (color LCD) border and the mode is displayed on the screen.

When SONAR mode is shown (as in Figure 2-1), press **ENTER** or **CLEAR**. The default soft keys are displayed. The display shows the sounder screen.

2.4 Selecting Repeater Mode

Depth data that is to be shared over the hsb² network is sourced from the device that has been designated as the master sonar unit. Only a DSM300 or an hsb² PLUS Series fishfinder display can be a master unit. For the DSM300 master to repeat its sonar image data to a display unit, the display must be designated as the REPEATER.

When using the DSM300 with a PLUS radar or chartplotter display, this is not an issue—the DSM300 is automatically set as the master and the display unit the repeater. However, the DSM300 can also repeat its image data on a fishfinder display. In this case, both units are capable of collecting sonar data. You must tell the display it is to be a repeater for the DSM300 and not a master unit on its own.

If your DSM300 is repeating its sonar data over a PLUS Series radar or chartplotter display, the proper settings are made automatically. You need do nothing else.

However, if your repeater display is a PLUS Series fishfinder, you must tell the unit to be a repeater.

➤ To set the fishfinder display to be the sonar repeater:

1. Press the **DISPLAY** key until SONAR mode is selected, as described in the previous section.

2. Press the **MENU** key.
   The Menu soft keys appear.

3. Press the SONAR SET UP soft key.
   The Sonar Set Up menu appears.
4. Press the trackpad until the SONAR HSB MODE parameter is highlighted (selected).
5. Press the REPEATER soft key.
6. Press **ENTER**.

The display unit is now designated as the Repeater.

Details on setting up your DSM300 and display are given in Chapter 3.

2.5 Sonar Mode Display

When you first switch the display unit into Sonar mode, the scrolling bottom graph is displayed. This is a graphical representation of the echoes seen by the DSM300. As time passes, this display scrolls from right to left and becomes a record of the echoes seen. A typical display is shown in Figure 2-2.

The images at the right hand side of the display are the most recent echoes. Some echoes indicate fish, and others show the bottom. It can also indicate bottom structures, such as a reef or shipwreck. The upper and lower depth range limits are shown.

The sonar screen includes a status bar that displays transducer frequency and indicates which auto settings are enabled (Gain, Color Gain, Range, Zoom and Frequency), and alarm status (fish and shallow/deep water depths).

You can customize the sounder by choosing what is displayed and how it is displayed (including language and units). For example, you can set the scroll speed of the bottom graph display, and you can select the range to adjust the depth displayed.

You can view the cursor position and a variety of data (such as speed and depth) from the transducer and other equipment in user-selectable data boxes. These data boxes can be moved around the screen and they can be switched on or off.

Chapter 4 includes details on adjusting the display; other set up options are described in Section 3.4.

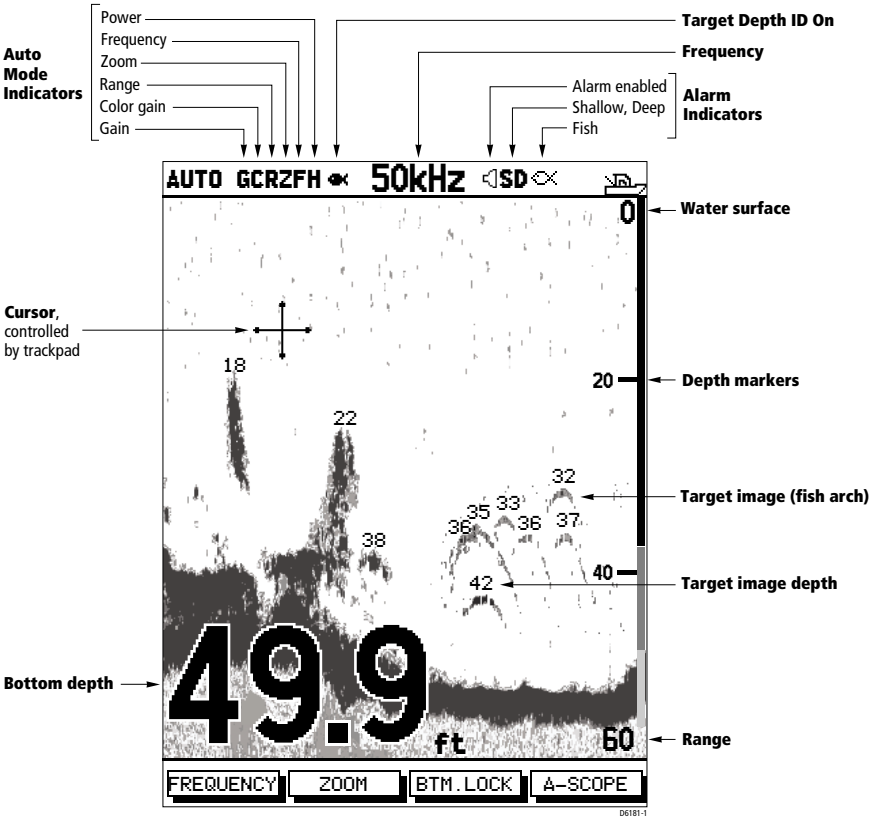


Figure 2-2: Typical Display in Sonar Mode

2.6 Operating Modes

Depending on the types of equipment you have connected, up to four full-screen modes – sonar, chart, radar, and data log are available. You select the operating mode using the **DISPLAY** key.

You can also set Windows On to split the display into two half-screen windows (horizontal or vertical) to show supplementary data, or to display sonar and chart or radar simultaneously.

Horizontal Half-Screen Window Options

Using horizontal half screens, the main operating mode is displayed in the upper window; you choose what is displayed in the lower window. The following information, if available on your system, can be shown:

Table 2-1: Horizontal Half-Screen Window Options

Full-screen mode	Horizontal Half-Screen Window Options
Sonar Mode	Course Deviation Indicator (CDI), Bearing and Distance Indicator (BDI), Depth/Temp graph, Chart plotter, Radar
Chart Mode	CDI, BDI, Navigation Data (databoxes), Radar, Sonar
Radar Mode	CDI, BDI, Navigation Data, Chartplotter, Sonar
Data Log Mode	Half-screens not available

Vertical Half -Screen Window Options

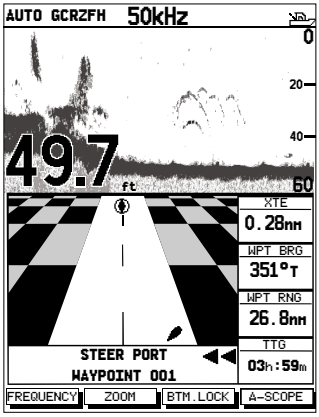
This option splits the sounder vertically. The left hand window displays data boxes; there are three different sets of data (A, B, and C) that you can select for display. The following information is available only in Sonar Mode:

Table 2-2: Vertical Half-Screen Window Options

Full-screen mode	Vertical Half-Screen Window Options
A	Temperature, Speed, Depth
B	Position (latitude and longitude), Course Over Ground (COG), Speed Over Ground (SOG), Depth
C	Waypoint Range and Bearing, COG, SOG, Depth

Note: *Receiving and displaying position data requires a GPS connected to your system.*

Horizontal Half-Screen



Vertical Half-Screen

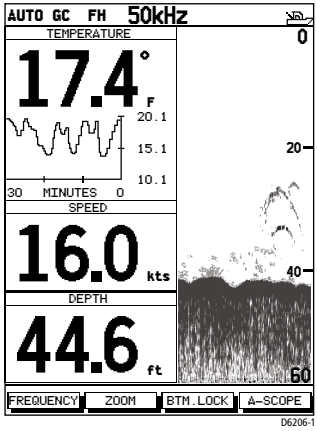


Figure 2-3: Half-Screen Windows in Sonar Mode

Details on selecting windows are given in Chapter 4. For details on the radar, chartplotter or fishfinder display, please refer to the Owner's Handbook supplied with that unit.

Sonar Options

The DSM300 provides controls to select additional modes:

- Frequency – you can select the transducer frequency: 50 kHz for wide coverage and deep water, 200 kHz for a detailed view, both frequencies simultaneously or auto-frequency. The default setting is auto-frequency, which determines the optimum frequency of operation based on the current depth.
- Bottom Lock – changes the operating mode to re-set the bottom. It provides a bottom-up view: the bottom is used as the reference, its image is flattened and depths are displayed here.
  Bottom lock mode is used primarily to filter out the bottom structure and display fish details only.
- A-Scope – displays a real-time image of the bottom structure and fish directly below the transducer. The A-Scope window also displays the patented Bottom Coverage width indication.
- Zoom – enlarges all or part of the bottom graph display. You can select x2, x4, or x6 magnification and the zoom area can be automatically or manually adjusted.

You can select the Zoom or Bottom Lock image to be displayed in place of the regular bottom graph display. Alternatively, you can set the display window to be split vertically with the bottom graph displayed in the right hand screen and the Zoom or Bottom Lock image displayed in the left hand screen. See Figure 2-4.

If you choose dual frequency, the scrolling bottom graph is displayed in both frequencies, split horizontally. Zoom, Bottom Lock, or A-Scope can be displayed with the dual frequency graph.

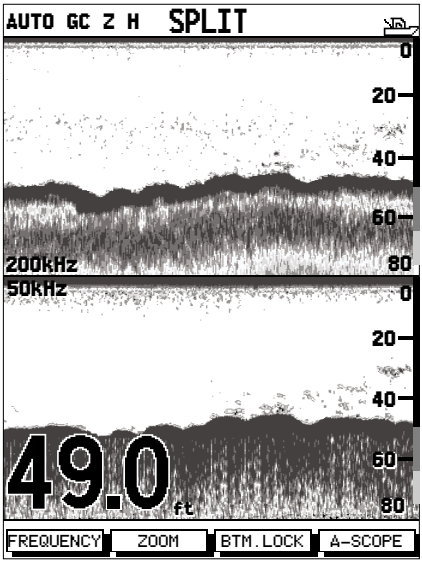
All of these options are available when the sonar data is displayed in a half-screen window.

Sounder Functions

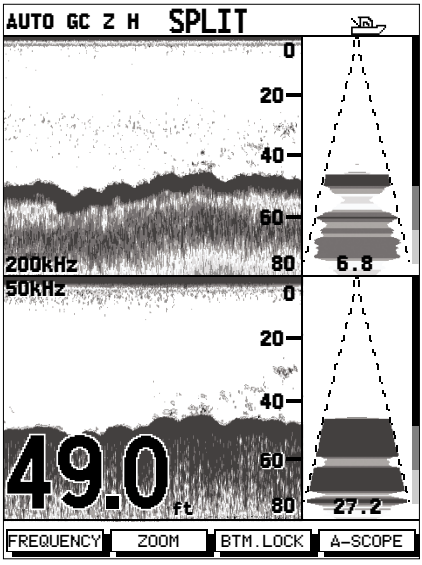
The DSM300 includes the following functions:

- Automatic or manual selection of scroll speed for bottom graph display
- Automatic or manual selection of transducer frequency
- Automatic or manual selection of depth range limits
- Automatic or manual selection of Gain, Color Gain, and STC settings
- Set up alarms for Fish, Shallow water and Deep water
- VRM marker to determine depth and distance

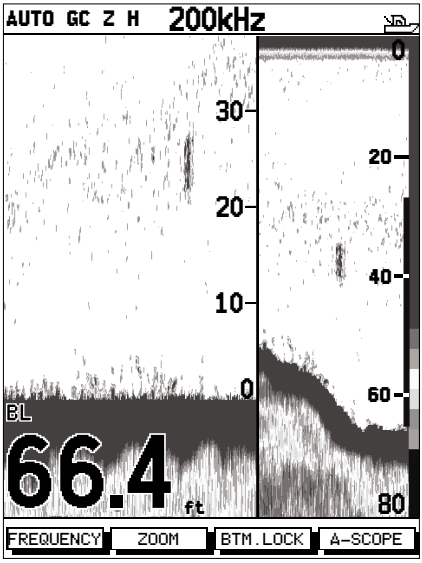
Operation of these functions is described in Chapter 4 and Chapter 5.



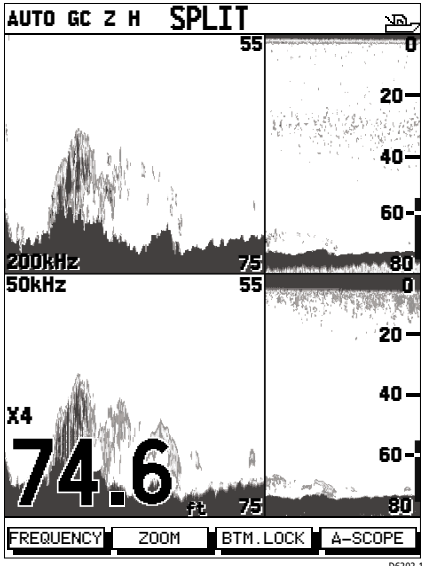
Split Frequency



Split Frequency with A-Scope



Bottom Lock Split with Bottom Graph



Zoom Split with Split Frequency

Figure 2-4: Sonar Display Options

2.7 Simulator Mode

The DSM300 includes a simulator function that enables you to practice operating in Sonar Mode without data from the transducer.

Before using Simulator mode, make sure the display cable is connected from the DSM300 to the display unit and that both the DSM300 and display unit are connected to power.

If you have not fully installed the sonar module, you can still operate in Simulator mode by connecting the DSM to the display device. Then connect the DSM300 and the display unit to a 10.7–32VDC power supply, attaching the red wire from the power lead to positive (+) via a quick blow 8A fuse and the black wire to negative (–).

Figure 2-5 demonstrates how to setup the DSM300 for Simulator mode.

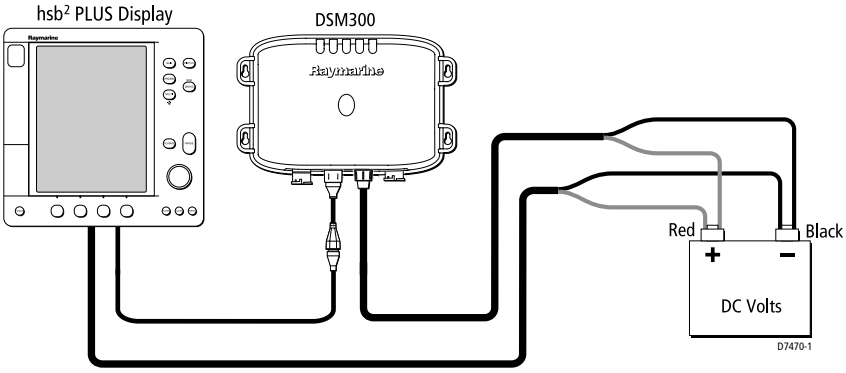


Figure 2-5: Simulator Mode Setup

Viewing Simulator Data

After you have properly connected and powered up the DSM300 and display units, you can toggle Simulator mode on and off using the Sonar Setup menu.

➤ To view simulated sounder images:

1. Press the **MENU** key on display unit.
   The Setup soft keys appear.

2. Press the SONAR SET UP soft key.
   The Sonar setup menu pop-up is displayed.
3. Use the trackpad to move the selection bar over the option SONAR SIMULATOR. The simulator soft keys are displayed.
4. Press the ON soft key to switch on the sonar simulator.
5. Press **ENTER** twice to return to the default display.

When simulator mode is on a simulator dialog box is displayed.

When the display is switched off then on again, simulator mode is maintained. It is recommended that you select the System Set Up Menu and switch off simulator mode when you have finished.

Note: *Any waypoints placed on the chartplotter in simulator mode are retained in the database list and are available for use in routes.*

Chapter 3: System Setup

3.1 Introduction

Once you have installed your DSM300 and are familiar with its basic operation (described in Chapter 1 and Chapter 2), you need to set it up so that it displays information according to your preferences.

Note: *This chapter describes using the DSM300 Digital Sounder Module with a Raymarine hsb² PLUS (Pathfinder) Series display. Instructions for setting up the DSM300 with a C Series or E Series display are available in the handbooks for those products.*

This is achieved using the soft key controls that are displayed when you press the **MENU** key.

In most cases, you will only need to use the **MENU** key options when you first set up your system. As you become more familiar with your system, you may decide to customize some aspects, such as the screen and help setting.

Note: *All settings described in this chapter are retained when the unit is powered off. However, there is a one-minute delay from the time you make the setting change to when the DSM300 places it in memory. If you power down the sounder less than one minute after making a change, the setting is lost.*

This chapter covers the following topics:

- Changing the default set up parameters
- Sounder specific parameter functions and default settings

You should check the functions of the parameters and decide on the new settings before making the changes.

3.2 Changing the Set Up Parameters

The set up parameters are divided into two sections:

- **System**, to control the aspects of the system that are not specific to the sounder module.
- **Sonar**, to control the Sonar-mode display preferences, including HSB mode, calibration, and simulator.

This section provides instructions for displaying and changing the default values. The following sections list the parameters and their possible settings and describe the function of each parameter in turn.

➤ To change settings:

1. Press the **MENU** key in Sonar mode to display the set up soft keys.

2. Press the soft key for the set up you desire.

   The requested set up menu is displayed, listing the parameters and their current settings.

3. Use the trackpad to move the selection bar up and down the list. An arrow is displayed at the top or bottom right-hand corner if you can scroll the list to display further parameters.

   As each line is highlighted, the soft keys are updated to show the settings available.

   - For parameters that have a numeric value, or more than four possible settings, a scroll list is displayed above two of the soft keys.
   - Some parameters are controlled by a slider that is displayed above two of the soft keys.
   - For some parameters, a soft key provides access to a sub-menu of further options.

4. Press the soft key corresponding to the desired setting or, for scroll lists, use the soft keys to scroll forwards or backwards through the list until the desired setting is displayed. This setting is retained when you move the selection bar on to the next parameter in the menu list.

   For sliders, press the appropriate soft key repeatedly to increase or decrease the slider value in individual steps, or press and hold the key to change the setting quickly.

5. Once you have set all the desired values, press **ENTER** to clear the menu and return to the set up soft keys.

6. Press **ENTER**, **MENU**, or **CLEAR** to clear the soft keys and return to the default display.

3.3 System Set Up Parameters

The SYSTEM SET UP option enables you to set up your system configuration and personal preferences.

The following table lists the System menus and their options, shows the factory default setting, and provides a space for you to make a note of your new setting. Each parameter is described in the following subsections.

Table 3-1: System Set Up Parameters

Menu	Options	Factory Default	New Setting
DATA BOXES			
POSITION	OFF, LAT/LONG, or TDs	OFF	
SPEED	OFF or ON	OFF	
DEPTH	OFF or ON	OFF	
COG	OFF or ON	OFF	
SOG	OFF or ON	OFF	
TIME	OFF or ON	OFF	
DATE	OFF or ON	OFF	
WIND	OFF, APPARENT, TRUE, BOTH	OFF	
WAYPOINT	OFF, LAT/LON, RNG/BRG/TTG	OFF	
CROSS TRACK ERROR	OFF or ON	OFF	
HEADING	OFF or ON	OFF	
LOG/TRIP	OFF or ON	OFF	
PILOT	OFF or ON	OFF	
VMG	OFF, WIND, WPT, or BOTH	OFF	
TEMPERATURE	OFF or ON	OFF	
TIDE SET/DRIFT	OFF or ON	OFF	
BEARING MODE	MAGNETIC OR TRUE	TRUE	
CURSOR REFERENCE	MAG/TRUE or RELATIVE	RELATIVE	
CURSOR READOUT	OFF, LAT/LONG, RNG/BRG, or BOTH	RNG/BRG	
DAY/NIGHT	DAY/NIGHT	DAY	
HELP	OFF or ON	ON	
SOFT KEYS	OFF or ON	ON	
KEY BEEP	OFF or ON	ON	
MOB DATA	DR or POSITION	DR	
PILOT POP-UP	OFF or ON	OFF	

Table 3-1: System Set Up Parameters

Menu	Options	Factory Default	New Setting
MENU TIMEOUT PERIOD	NO TIMEOUT, 10, 20, or 30 SECONDS	NO TIMEOUT	
DISTANCE UNITS	NAUTICAL MILES, STATUTE MILES, KILOMETERS, or KILOYARDS	NAUTICAL miles	
SPEED UNITS	KNOTS, MILES PER HOUR, or KM PER HOUR	KNOTS	
DEPTH UNITS	METERS, FEET, OR FATHOMS	FEET	
TEMPERATURE UNITS	CENTIGRADE or FAHRENHEIT	FAHRENHEIT	
VARIATION SOURCE	AUTOMATIC or MANUAL	AUTOMATIC	
BRIDGE NMEA HEADING	OFF or ON	OFF	
NMEA-OUT SET UP			
APB	OFF or ON	ON	
BWC	OFF or ON	ON	
BWR	OFF or ON	ON	
DBT	OFF or ON	ON	
DPT	OFF or ON	ON	
MTW	OFF or ON	ON	
RMB	OFF or ON	ON	
RSD	OFF or ON	ON	
RTE	OFF or ON	ON	
TTM	OFF or ON	ON	
VHW	OFF or ON	ON	
VLW	OFF or ON	ON	
WPL	OFF or ON	ON	
GGA	OFF or ON	ON	
GLL	OFF or ON	ON	
RMA	OFF or ON	ON	
RMC	OFF or ON	ON	
VTG	OFF or ON	ON	
ZDA	OFF or ON	ON	
CURSOR ECHO			
RADAR CURSOR IN	OFF or ON	OFF	
CHART CURSOR IN	OFF or ON	OFF	
SEATALK CURSOR OUT	OFF or ON	OFF	
CURSOR ECHO LOCAL	OFF or ON	ON	
DATE FORMAT	DD/MM/YY or MM/DD/YY	MM/DD/YY	

Table 3-1: System Set Up Parameters

Menu	Options	Factory Default	New Setting
TIME FORMAT	12 HOUR or 24 HOUR	12 HOUR	
TIME OFFSET	UTC, or local offset value: Plus or minus up to 12 hours, in whole hours	UTC	
GPS SOG/COG FILTER	HIGH, MEDIUM, or LOW		
COMPASS SET UP	LINEARISE COMPASS or ALIGN HEADING		
LANGUAGE	English (UK), English (US), Danish, French, German, Dutch, Icelandic, Italian, Norwegian, Portuguese, Spanish, Swedish, or Finnish	English (US)	
SIMULATOR	OFF, DATA, RADAR, or BOTH	OFF	

Data Boxes

Press the SELECT BOXES soft key to display the data box sub-menu. This enables you to select up to 6 data boxes that you can display on the sounder.

Notes: **(1)** *A fixed set of sixteen (nine in the monochrome displays) of these data items are available for display in the Nav Data half-screen window.*

(2) *In addition to these grouped data boxes, boxes for the cursor readout, VRM/EBL data, waypoint data, MOB data and simulator status are displayed when selected or when the appropriate function is active.*

(3) *Radar data is available only if radar equipment is installed and connected.*

Data boxes provide regularly used data in a compact form so that most of the graphics can still be seen. The ones you select here can be turned on and off as a group during normal operation, and you can also move them around the screen individually using the context-sensitive cursor. See "Viewing Data Boxes" on page 50.

Bearing Mode

The mode (magnetic or true) of all the bearing and heading data displayed. This is indicated in the radar status bar after the heading value, if displayed.

Cursor Reference

The mode of the bearing data displayed for the cursor readout. The bearing information can be displayed in either of two forms:

- Relative: The bearing relative to your boat's heading.
- Mag/True: The actual bearing in either degrees magnetic or degrees true. This option is only available in Radar mode if your system includes a radar display and you have heading data from a compass.

If you choose this mode, the selection you made for the previous parameter (Bearing Mode), °M or °T, is displayed in the cursor (Rng/Brg) data boxes. The current units are shown for the heading value in the status bar at the top of the screen.

Cursor Readout

This option controls whether radar cursor data is shown in latitude and longitude or in range and bearing. Alternatively you can show both types of readout in separate boxes or turn the cursor data box off.

You can also turn the cursor readout box(es) on and off during normal operation, via the SCREEN default soft key.

Day/Night

This option enables you to change the display between day and night modes.

On a color LCD, NIGHT mode uses a different color palette, more suited to night time viewing. The default setting is DAY.

For monochrome displays, the normal DAY presentation displays black targets on a white background. If you select NIGHT, the picture is reversed, so that white targets are shown on a black background to reduce the intensity of the image.

Help

When Help is set to ON, a prompt appears when selecting a soft key or menu choice and when using the context-sensitive cursor. The help message is cleared when an action is selected.

Soft Keys

When the Soft Keys option is set to ON, the default soft keys are displayed if no other operation is in progress.

When the Soft Keys option is set to OFF, the default soft keys are only displayed when a soft key is pressed and they disappear if no operation is performed for 10 seconds.

Key Beep

This option controls whether or not the keys sound a tone when you press them.

MOB Data

This option controls whether MOB data is based on position data, or on dead reckoning (DR). Dead reckoning normally provides a better indication of the course to an object in the water, on the assumption that your boat and the object are both subject to the same tide and wind effects.

Autopilot Pop Up

This option controls whether or not the autopilot pop up is displayed. When set to ON, when the status and locked heading of the autopilot changes, they are displayed in a pop up box. The box is removed from the display after two seconds. When Autopilot Pop set to OFF, the pop up box is disabled.

Menu Timeout Period

With no timeout set, menus and soft key labels remain displayed until you clear them by pressing **ENTER**, **CLEAR** or the appropriate dedicated key.

If you set a value here, the menus and soft key labels are cleared if a key has not been pressed for the specified number of seconds.

This setting does not affect the default soft key labels, which are controlled by the Soft Keys option (see above).

Units

You can set the units for speed, depth, and temperature. The units you set will be used to display all data, including information received from other instruments on the system. However, the distance units do not affect the instrumented range of the radar, which is always in nautical miles.

Note: *The 'Units' values set here are also used in the other display modes.*

Variation Source

The variation value is the difference between True and Magnetic direction data for heading or bearing values. The Variation Source option provides soft keys for selecting Auto or Manual variation mode, displays the current variation value for each and highlights the currently selected mode.

Auto Mode

If you select Auto mode, the unit obtains the value of variation automatically, normally from received data. The variation value that is used depends on the data available and is selected in the following order of priority:

1. Variation value from the same source as the heading data:
   - If heading data is being taken from NMEA, then variation is also taken from NMEA
   - If heading is taken from SeaTalk, then SeaTalk variation is used
2. Variation value from a different source:
   - If heading data is being taken from NMEA, but no NMEA variation is available, then variation is taken from SeaTalk
   - If heading is taken from SeaTalk, but no SeaTalk variation is available, then variation is taken from NMEA
3. A calculated variation value, using position data, if no SeaTalk or NMEA value is available
4. The current manual variation value, if no SeaTalk or NMEA value and no position data is available

Manual Mode

If you select Manual mode, by pressing either of the MANUAL keys, you can specify the local variation value according to the area in which you are operating. Press the appropriate MANUAL key to adjust the variation up or down, to a maximum of 30° East or West.

This value is then transmitted to any other SeaTalk instruments on your system. It is retained if you turn the display off and on again.

In Manual mode, incoming NMEA variation is ignored. However, if the variation is changed on another SeaTalk instrument, the new value is used and the manual value that is displayed is updated.

Note: *The Manual variation value defaults to 0°, so it is important to set up a value if variation is not available from an external source.*

Bridge NMEA Heading

The display unit sends NMEA input data to the SeaTalk bus. The Bridge NMEA Heading option can be used to prevent NMEA heading data being bridged onto the SeaTalk bus.

For example, if you have a course computer connected on SeaTalk and NMEA, and an active compass connected on NMEA (for MARPA), SeaTalk data overrides NMEA data in the course computer.

You should therefore switch OFF the Bridge NMEA Heading option to ensure the course computer receives the same NMEA heading input as the rest of the system.

NMEA-Out Set Up

This option lets you disable the transmission of specific NMEA sentences, which may be necessary if you have other instruments sending the same data as your sounder.

For example, if the DPT (depth) sentence is set ON but the sounder's transducer is designed to sense temperature and speed only, the depth value will be transmitted as zero. If you also have an ST60 Depth instrument installed, there may be confusion between the zero depth sent by the sounder and the actual depth sent by the ST60. Turning OFF the DPT sentence disables the reading from the sounder.

The factory default for all NMEA sentences is transmission ON. Disable the sentence by selecting the OFF soft key.

The following table displays the available NMEA sentences and their meanings.

Table 3-2: NMEA Sentences

Sentence	Meaning
APB	Autopilot Sentence "B"
BWC	Bearing & Distance to Waypoint
BWR	Bearing & Distance to Waypoint – Rhumb Line
DBT	Depth Below Transducer (see note below)
DPT	Depth (see note below)
MTW	Water Temperature
RMB	Recommended Minimum Navigation Information
RSD	Radar System Data

Table 3-2: NMEA Sentences

Sentence	Meaning
RTE	Routes
TTM	Tracked Target Message
VHW	Water Speed and Heading
VLW	Distance Travelled through the Water
WPL	Waypoint Location
GGA	Global Positioning System Fix Data
GLL	Geographic Position – Latitude/Longitude
RMA	Recommended Minimum Specific Loran-C Data
RMC	Recommended Minimum Specific GPS/TRANSIT Data
VTG	Course Over Ground and Ground Speed
ZDA	Time and Date

The changes do not take effect until after **ENTER** is pressed. Consult your NMEA instrumentation documentation to determine which strings should remain ON.

Note: *The DSM300 outputs the same depth value for DBT and DPT, regardless of the Depth Offset value in Sonar Setup.*

Cursor Echo

You can set up an integrated system so that radar and chartplotter displays connected via SeaTalk can display each other's cursors.
Cursor echo functions so that you can display a chart cursor on the radar picture, or a radar cursor on the chart picture (you cannot display a remote radar cursor in a radar window nor can you display a remote chart cursor in a chart window). When the appropriate options are switched on, each display shows its own cursor, plus the cursor of the other display with appropriate cursor text (RDR or CHRT) to indicate its origin. This means that you could move the cursor over a target on the radar display and check the identity of the target by looking at the radar cursor position on the chartplotter.

Press the CURSOR ECHO soft key to display the cursor transfer soft keys. The following options can be toggled ON or OFF:

- Radar Cursor In: displays the cursor from another radar on the chart display or chart window (default - OFF).
- Chart Cursor In: displays the cursor from another or chartplotter on the radar display or radar window (default - OFF).

Note: *The remote display must have SeaTalk Cursor Out enabled.*

- SeaTalk Cursor Out: enables the output, onto SeaTalk, of the display's own cursor (default - OFF).
- Cursor Echo Local: echoes the cursor position between open windows on the same display (default - ON).

If you set the options to OFF, no cursor echo information is displayed.

Date and Time Settings

Set your preferred date format (DD/MM/YY or MM/DD/YY) and time format (12 or 24 hour). If you wish to display local time, use the soft keys to change from UTC to the desired time offset. This can be up to plus or minus 12 hours, in hourly steps.

GPS SOG/COG Filter

The SOG/COG filter averages the velocity vectors to compensate for the oscillating motion of the boat, giving a clearer indication of the boat's course and speed. The filter does not affect the calculation of the GPS position. The velocity vectors calculated from the GPS Signal give an instantaneous measure of speed and direction of the GPS antenna. The COG and SOG can therefore seem erratic under certain conditions. For example, when a boat is moving slowly through rough seas, the antenna moves from side to side as well as in the direction of the boat.

Slow moving boats, or boats sailing in rough seas will benefit from a high setting, whereas a power boat that can quickly change speed and direction will benefit from a low setting.

Select the SOG/COG filter setting as required. This can be set to HIGH, MEDIUM or LOW.

Compass Set Up

This option is used to calibrate a Raymarine heading sensor such as the Pathfinder Smart Heading System. Controls are provided for LINEARISE COMPASS, which detects and corrects for heading errors caused by metal objects, and ALIGN HEADING, which matches the displayed heading to a known heading or transit.

Refer to the Handbook supplied with your heading sensor for more details.

Language

Select the language in which you wish information to be displayed. The selected language will be used for screen text, labels, menus, and options, but will not affect the letters displayed by the context-sensitive cursor. The language setting also affects the display format for lat/long position information.

Simulator

The simulator enables you to operate your display without data from the transducer and/or external data sources. The system set up simulator options have the following functions:

- Data provides simulated numerical data, and a waypoint display.
- Radar provides simulated radar picture, with example targets. The picture does not change if you change the range, although the range rings are adjusted (see radar documentation).
- Both provides simulated data and radar picture.

When the simulator is switched on, a SIMULATOR data box is displayed during operation, showing the simulation selected.

Sonar simulator mode is set in the Sonar setup menu, described in Section 3.4.

3.4 Sonar Set Up Parameters

The SONAR SET UP option enables you to set up the sounder according to your system configuration and your personal preferences.

The following table lists the Sonar Set Up parameters and their options, shows the factory default setting, and provides a space for you to make a note of your new setting. Each parameter is described in the following subsections.

Table 3-3: Sonar Mode Set Up Parameters

Parameter	Options	Factory Default	New Setting
TARGET DEPTH ID	OFF ON	OFF	
COLOR BAR	OFF ON	ON	
DEPTH DIGIT SIZE	LARGE SMALL	LARGE	

Table 3-3: Sonar Mode Set Up Parameters

Parameter	Options	Factory Default	New Setting
SONAR HSB MODE	REPEATER MASTER	MASTER	
DEPTH OFFSET	Value	0.0	
SPEED CALIBRATE	0% to 200%	100%	
TEMP CALIBRATE	–9.0 °F to +9.0 °F	0°F	
SONAR HISTORY	LARGE or SMALL	LARGE	
SONAR INT REJ	AUTO, LOW or HIGH	AUTO	
SONAR SIMULATOR	OFF ON	OFF	

Target Depth ID

You can select whether the depth is shown for sonar echoes displayed on the screen. When Target Depth ID is set to ON, the depth is displayed just above each fish echo. When set to OFF, the depth of each echo is not displayed.

Color Bar

The color bar indicates the range of echoes displayed in each color (shade of gray for monochrome displays). When set to ON the color bar is displayed on the right hand side of the display.

Depth Digit Size

The depth under the boat is displayed in the bottom left hand corner of the display. You can select small or large digits for the depth display.

Sonar HSB Mode

Note: *This parameter only pertains when the display to which you are outputting DSM300 image data is a PLUS Series fishfinder. If your display is a PLUS Series radar or chartplotter display, the REPEATER setting is automatically selected and cannot be changed.*

The Sonar HSB Mode setting designates whether the display showing sounder data is the MASTER unit from which depth data is to be sourced or a REPEATER of sonar data received from a master unit. Only one unit should be designated the master at a time.

Note: *Ensure that there is only one sonar master unit on the hsb² network. Having more than one master unit will cause unpredictable results.*

A sonar MASTER unit is connected directly to the transducer. Only a DSM300 or a PLUS Series fishfinder display can be designated as the master. A REPEATER display is connected via hsb² to the master unit so it can display sonar data the master has collected. A REPEATER can be a radar, chartplotter or fishfinder display. Because the DSM300 does not have a display of its own, the DSM300 is always designated as the MASTER. Therefore, all display units showing sonar data from the DSM300 must be designated as a REPEATER.

This is not an issue when showing DSM300 data on a radar or chart display because these units can never be a sonar master. In this case, the DSM300 is automatically set as the master and the display unit as the repeater. In fact, the MASTER selection is grayed out when the sounder module is connected to a PLUS Series radar or chart display.

However, if the display unit is a PLUS Series fishfinder, you are given a choice. You must set the fishfinder display to REPEATER so that there is no conflict on the hsb² network (the DSM300 is always designated as a master). You would only select MASTER when you want to control the PLUS Series fishfinder display rather than the DSM300. In this case, the fishfinder display unit must have its own transducer connected and the DSM300 must be powered off or have its HSB cable disconnected (thus removing it from the hsb² network).

Note: *If you switch the PLUS Series fishfinder display from REPEATER to MASTER, you must remove the DSM300 from the hsb² network and power off & on the display unit for the changes to take effect.*

Summary

1. When the display is a PLUS Series radar or chart unit, you can ignore this parameter; the REPEATER setting is made for you automatically.
2. When the display is a PLUS Series fishfinder and you are using the DSM300, select REPEATER.
3. When the display is a PLUS Series fishfinder and you want the display to show its own sonar data rather than that of the DSM300, select MASTER.
   In this scenario, the DSM300 must be powered off or be physically removed from the hsb² network.

Depth Offset

The depth offset is added to the measured depth value before it is displayed. You can specify the depth as a positive value (WATERLINE OFFSET) or a negative value (KEEL OFFSET). The depth offset can be set adjusted in 0.1 increments of the units

you have assigned for Depth Units in the setup parameters of the display unit: meters, fathoms, or feet.

Speed Calibrate

If the transducer is equipped with a speed paddle wheel, the DSM300 calculates the speed of the boat through the water. The speed calibrate option enables you to adjust the displayed speed so that it matches your actual speed through the water. You can adjust the displayed speed from 1% to 200%.

If the sounder reading is too low, set Speed Calibration to more than 100%. If the sounder reading is too high, set Speed Calibration to less than 100%.

Temperature Calibrate

If the transducer is equipped with a thermistor, the DSM300 calculates the temperature of the water. The temperature calibrate option enables you to adjust the displayed temperature. You can adjust the displayed temperature by –9.0°F to +9.0°F.

Sonar History

Sonar History determines the number of data sample columns that appear on the screen at one time. The options are: SMALL, which displays 240 columns of data or LARGE, which shows 480 columns.

Information displayed in a single column using the LARGE setting would occupy two columns with SMALL. As a result, twice as much data history is displayed under the LARGE setting. Data displayed using SMALL appears wider and scrolls across the screen faster.

Sonar Interference Rejection

Two or more sonar-equipped boats operating within range of each other can create interference on the sounder screen. This usually appears as vertical streaks in the water that do not represent actual targets.

The DSM300 includes a SONAR INT REJ option that can reduce such interference, either manually or automatically. LOW rejects only a small amount of the extraneous objects. Use this setting when you want to be sure that what has been removed are really false returns.
HIGH cleans up much more interference but can degrade the appearance of actual targets. AUTOMATIC selects the best rejection level for you.

The default setting is AUTOMATIC.

Sonar Simulator

The simulator enables you to operate your display without data from the transducer, in order to become familiar with the sounder features and functions.

All controls are functional in Simulator mode with the exception of STC.

Version/Serial Numbers

The area at the bottom of the Sonar Setup screen gives version information for the system.

This area is informational only; it is not editable.

DISPLAY SW VERSION displays the software version of the display unit.

MASTER SW VERSION displays the software version and product type of the master unit, which under most circumstances would be the DSM300.

MASTER S/N displays the serial number of the master unit, which under normal circumstances would be the DSM300.

Chapter 4: Basic Display Controls

4.1 Introduction

This chapter will help you to become familiar with the functions of the hsb² PLUS Series display unit's controls in Sonar mode. Information on operating Sonar display mode is provided in Chapter 5. Instructions for operating the DSM300 with your C Series or E Series display are available in the handbooks for those products.

Note: *All settings described in this chapter are retained when the unit is powered off. However, there is a one-minute delay from the time you make the setting change to when the DSM300 places it in memory. If you power down the sounder less than one minute after making a change, the setting is lost.*

Simulator

The DSM300 includes a simulator function that enables you to practice operating display controls in Sonar Mode without data from the transducer. Section 2.7 describes how to switch the display to simulator mode.

The DSM300 must be connected to an hsb² PLUS Series, C Series or E Series display unit to show echo sounder data.

4.2 Setting Color and Brightness

Brightness settings depend on the type of display you have. Monochrome displays offer lighting and contrast settings, while color displays have brightness and color settings.

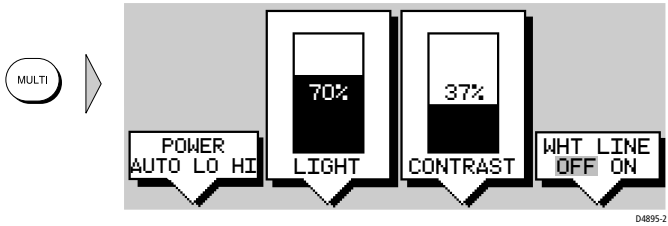
Lighting and Contrast (Monochrome Displays)

You can change the level of backlighting and contrast for the screen and keys. The key lighting is set the same as the screen lighting, except that it remains switched on at its lowest level even when the screen lighting is turned off, so that you can always find the keys.

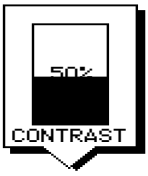
➤ To change the lighting and contrast:

1. Press the **MULTI** key (or the **MULTI** knob on CRT radar units) to display the soft key controls:

   The last-used soft key is highlighted in inverse video (white text on a black background).



2. Press the LIGHT soft key if it is not already highlighted.
3. The LIGHT soft key toggles lighting ON/OFF.
4. Use the trackpad (up or down) to increase or decrease the setting. You can press and hold the trackpad to change the setting more rapidly. The lighting level is adjusted as you change the setting.



5. Press the CONTRAST soft key. Adjust the setting in the same way as for the lighting. There are 64 different contrast levels.
6. Press **ENTER** to return to the default screen, with the new lighting and contrast levels retained, or press **CLEAR** to discard the changes and return to the default screen.

If lights are left ON when you switch off the display, the next time the display is switched on, the lights will be ON, but at the default setting of 42%. The new contrast level is retained until you reset it, unless you set the control very low or very high; in this case, the contrast will be restored as follows:

Contrast set > 30% restored to 30%
Contrast set > 70% restored to 70%

Brightness and Color Settings (Color Displays)

The **MULTI** key on a color LCD unit provides controls to set up the display colors and brightness. You can choose the background color and the color threshold; color threshold lets you determine which echoes are displayed, by selecting the minimum color strength the sounder uses.

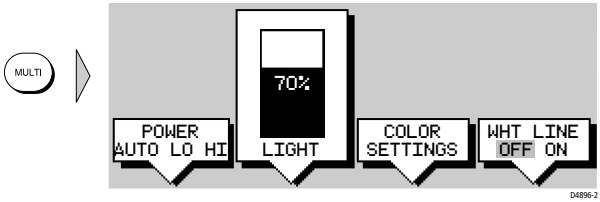
You can also select the color set, for a bold or soft color palette. The brightness of the screen can be adjusted over a wide range, suitable for viewing in daylight (high brightness level) or at night (low brightness level).

The key lighting is automatically adjusted as you alter the screen lighting, so that you can always find the keys. If you set the backlight to a high level, the key lighting is dimmed; if you set the backlight to a low level, the key lighting level is increased.

Adjusting the Brightness

➤ To change the screen brightness:

1. Press the **MULTI** key to display the soft key controls:



2. The LIGHT soft key indicates the brightness level, use the trackpad (up or down) to increase or decrease the setting. You can press and hold the trackpad to change the setting more rapidly. The brightness level is adjusted as you change the setting.
3. Press **ENTER** to return to the default screen, with the new brightness level.

➤ To set the screen brightness to 100%:
Press and hold the **MULTI** key for one second. The brightness is increased to 100%.

The brightness level is retained when you switch off the display.

Note: *During night-time use, the brightness level may be set very low. When subsequently operated during the day it may not be apparent that the display is on. Press* **MULTI***, and then use the trackpad to increase brightness. You can also press and hold* **MULTI** *for one second to set the brightness to 100%.*

Selecting the Background Color

Five colors are available for the sonar display background – black, dark gray, light gray, white, and dark blue. The color you select is used on all the sounder windows (scrolling bottom, Zoom, Bottom Lock, and A-Scope).

You will probably find that you need to change the background color in different light conditions. For example, a white background is probably easiest to see in bright sunlight, but a black background may be preferable at night.

➤ To change the background color:

1. Press the **MULTI** key to display the soft key control.
2. Press the COLOR SETTINGS soft key.
3. Press the BGROUND COLOR soft key. The background color soft keys are displayed below a pallet of available colors. The selected color is highlighted.

4. Press the left or right BACKGROUND COLOR soft key until the desired color is highlighted.
   The sounder display changes, so you can see the effect as you change the background color.
5. Press **ENTER** or **CLEAR** twice to return to the **MULTI** soft keys.

Selecting the Color Threshold

You use the color threshold control to determine the minimum echo strength that is displayed. Each range of echo strengths is displayed in a color as shown in the color bar; you select the minimum strength that is displayed by blanking echo colors below the required minimum.

If you blank a color, the corresponding echoes are displayed in the background color. You can remove up to six colors, but you cannot remove the strongest color.

The color threshold you select is used on all the sounder windows (scrolling bottom, Zoom, Bottom Lock, and A-Scope).

➤ To change the color threshold:

1. Press the **MULTI** key to display the soft key controls.
2. Press the COLOR SETTINGS soft key.
3. Press the COLOR THRESH soft key.
   The color threshold soft keys are displayed below color indicator showing the available echo colors.
   The weakest color is at the bottom of the indicator, the strongest color at the top; you can remove colors from the bottom up.
4. Press the left or right ADJUST COLOR THRESHOLD soft key to change the color threshold.
   Pressing the left key removes out the next color up, it increases the minimum strength displayed.
   Pressing the right key displays the next color down, it decreases the minimum strength displayed.
5. Press **ENTER** or **CLEAR** twice to return to the **MULTI** soft keys.

Selecting the Color Settings

➤ To change the color palette:

1. Press the **MULTI** key to display the soft key controls.
2. Press the COLOR SETTINGS soft key.
3. Press the COLOR SET soft key.
   This toggles between color set 1, bolder colors, and color set 2, softer colors.

4. Press **ENTER** or **CLEAR** twice to return to the default screen.

4.3 Controlling the Display

You control the display using the cursor and control keys. You start all operations from the default screen, from which the default soft keys are displayed:

When you have completed an action using the soft keys, press **ENTER** or **CLEAR** to return to the default screen; you may need to press **ENTER** or **CLEAR** several times to back-track through the soft key hierarchy.

Note: *If you have set up your system so that the default soft keys are not displayed all the time, press any soft key to display the labels.*

The remainder of this section describes how to select the mode of operation and switch half-screen windows on/off.

The controls are summarized in the laminated Quick Reference card that accompanies this handbook.

Selecting the Display Mode

If the data is available on your system, the following display modes can be selected:

- Radar
- Chart
- Sonar (Fishfinder)
- Data Log

You use the **DISPLAY** key to select the full-screen display mode. The **DISPLAY** key also accesses the soft keys for the half-screen window options for additional information.

➤ To select Sonar mode:

1. Press the **DISPLAY** key.
   The DISPLAY pop-up appears, as shown in Figure 4-1 . The selected mode is shown by an icon with a black (monochrome display) or red (color LCD) border and the mode is displayed on the screen.
2. Continue to press **DISPLAY** until SONAR mode is shown.

3. Press **ENTER** or **CLEAR**.
   The Sonar screen is displayed with its default soft keys. The associated half-screen window soft keys are also displayed.

You can also set Windows On to split the display into two half-screen windows (horizontal or vertical) to show supplementary data, or to display sonar and chart or radar simultaneously. Split screen options are described in the following sections.

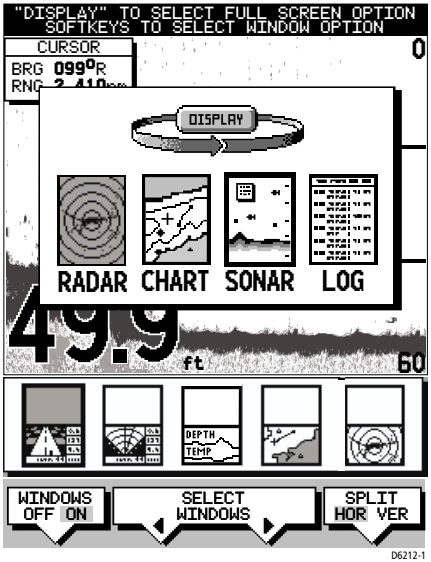


Figure 4-1: Selecting the Display Mode

Horizontal Half-Screen Window Options

Using horizontal half screens, the main operating mode is displayed in the upper window; you choose what is displayed in the lower window.

The following information, if available on your system, can be shown:

Table 4-1: Horizontal Half-Screen Window Options

Full-screen mode	Horizontal Half-Screen Window Options
Sonar Mode	CDI, BDI, Depth/Temp, Chart, Radar
Chart Mode	CDI, BDI, Nav Data, Radar, Sonar

Table 4-1: Horizontal Half-Screen Window Options

Full-screen mode	Horizontal Half-Screen Window Options
Radar Mode	CDI, BDI, Nav Data, Chart, Sonar
Data Log Mode	Half-screens not available

- **Chart display**: If data is available on the display or via the hsb^2 PLUS link, it can be displayed.
- **Radar display**: If data is available on the display or via the hsb^2 PLUS link, it can be displayed.
- **Depth/temp graph** (Sonar mode only): This shows a plot water temperature and depth against time.
- **CDI**: This gives the Course Deviation Indicator graphical display, with data relating to the target waypoint.
- **BDI**: This gives the Bearing and Distance Indicator graphical display, with data relating to the target waypoint.
- **Nav Data** (Chart or Radar mode): This shows sixteen data boxes, providing navigational data in the units specified in your set up.

➤ To select a Horizontal half-screen window for display:

1. From the full-screen Sonar mode, press the **DISPLAY** key. The following soft keys are displayed with an image of each available window:

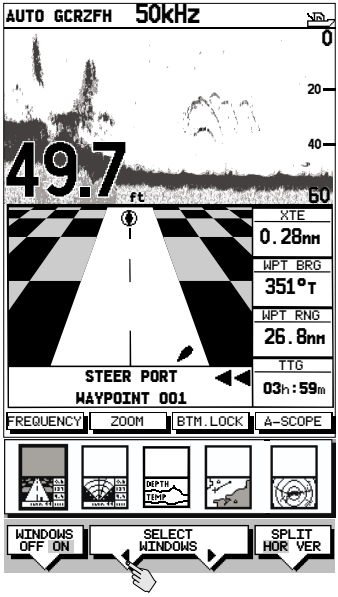
2. Set SPLIT to HOR. To select a different window, press either SELECT WINDOWS soft key until the desired window is highlighted. If necessary, press WINDOWS OFF ON to toggle Windows on.
3. Press **ENTER**.
4. To toggle Windows off, press the WINDOWS OFF ON soft key.

If any data boxes were displayed at the bottom of the full-screen image, they are switched off until you return to full-screen mode.

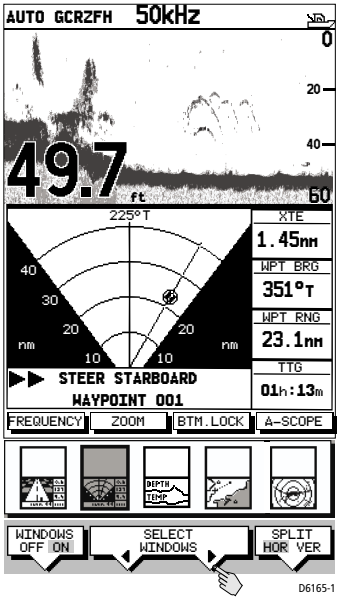
Note: *You can use the SCREEN soft key in chart mode to switch the data boxes on. They are displayed in the upper window.*

Figure 4-2 and Figure 4-3 show the half-screen horizontal windows (in Sonar mode).

CDI Window



BDI Window



Depth/Temperature Window

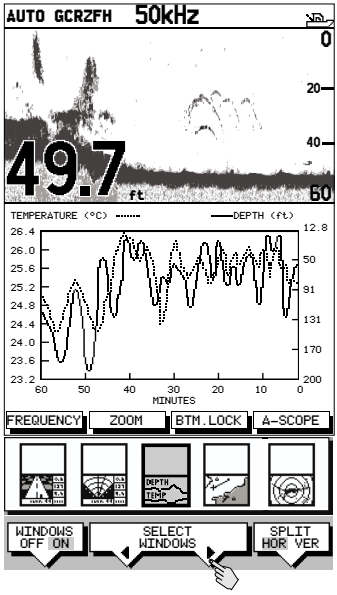


Chart Window

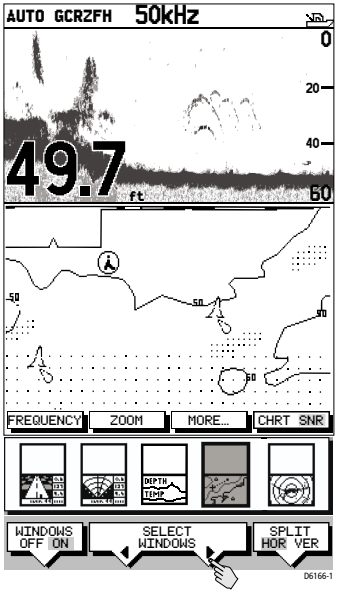


Figure 4-2: Horizontal Half-Screen Windows

Radar Window

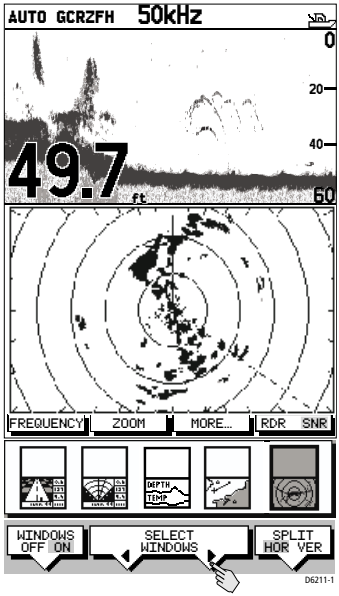


Figure 4-3: Radar Half-Screen Window

Vertical Half-Screen Window Options

DISPLAY

You can also use the **DISPLAY** key to select a data window that is vertically split with the full-screen Sonar mode display. Vertical half-screen windows are only available in Sonar mode. Three data windows are available, each window provides several large-format data boxes for specific information as follows:

- Data Window A – provides surface temperature with a 30 minute temperature graph, speed through water, and depth.
- Data Window B – provides position, course over ground (COG), speed over ground (SOG), and depth.
- Data Window C – provides waypoint range and bearing, course over ground (COG), speed over ground (SOG), and depth.

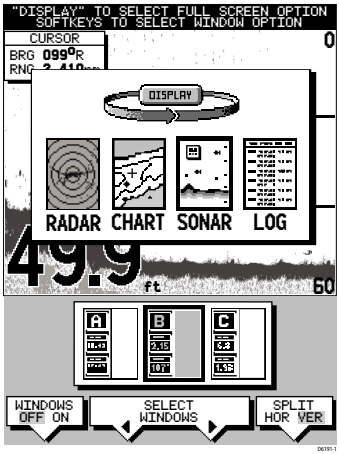


Figure 4-4: Selecting Vertical Half-Screen Windows

Note: *Receiving and displaying position data requires that a GPS is connected to your Raymarine system.*

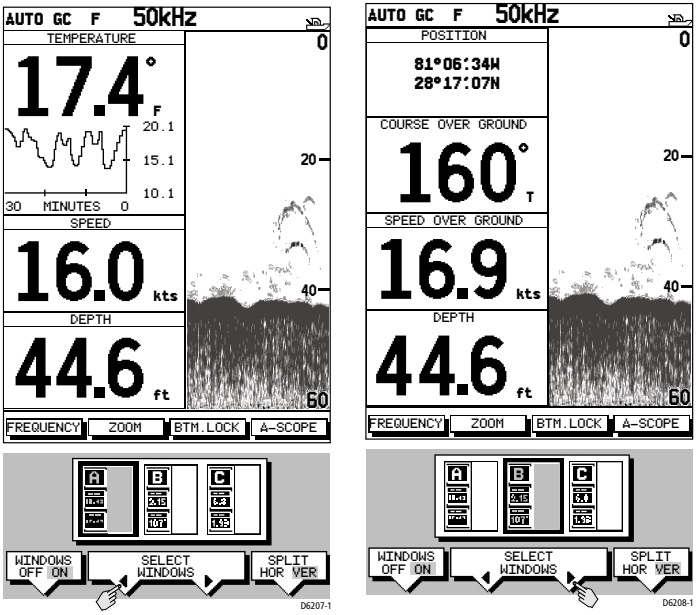


Figure 4-5: Vertical Half-Screen Windows A and B

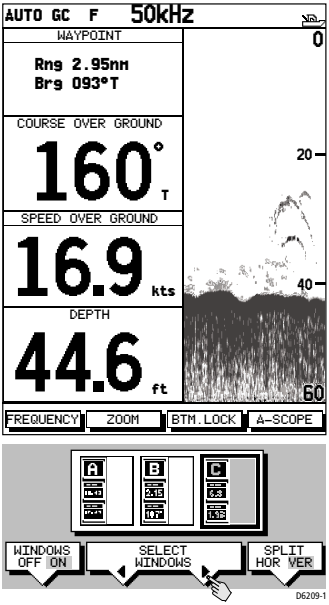


Figure 4-6: Vertical Half-Screen Window C

Returning to the Full-Screen Display

To return to the full-screen display you can turn windows off, as previously described. To return to full-screen display:

➤ Press and hold the **DISPLAY** key for 2 seconds to return to the currently selected full-screen (upper window) display.

Switching Between Sounder and Other Modes

When you have both sounder and chart displayed in half-screen windows you can toggle operating control between the sounder and the chart window using the CHRT SNR soft keys.

➤ To change the active window when you are displaying the sonar/chart horizontal split window, press the CHRT SNR soft key to toggle control between the sounder and chart display. The current active display is highlighted in gray (monochrome display) or red (color LCD) on the CHRT SNR label and the cursor appears in that window.

When you have both sounder and radar displayed in half-screen windows you can toggle operating control between the sounder and the radar window using the RDR SNR soft keys.

➤ To change the active window when you are displaying the sonar/radar horizontal split window, press the RDR SNR soft key to toggle control between the sounder and radar display. The current active display is highlighted in gray (monochrome display) or red (color LCD) on the RDR SNR label and the cursor appears in that window.

If a window is active, i.e., control of the cursor via the trackpad is available in that window, and you switch windows off, control automatically returns to the full-screen (upper/right window) mode.

4.4 Display Control Functions

Sonar mode automatically locates the bottom and displays the information using an appropriate scroll speed and range. However, controls are provided so you can adjust scroll speed and range. You can also select the transducer frequency and select certain data for display. This section describes how to use the controls to set-up your sounder display:

- Viewing databoxes
- Changing the scroll speed
- Changing the range
- Selecting the power setting
- Selecting the frequency

In addition this section describes how to select the Sonar mode display options.

- Display Bottom Lock
- Display A-Scope
- Zoom an area of the image.

Viewing Data Boxes

The cursor data box and a group of up to six data boxes can be displayed if the information is available on your system. You select which data is displayed in the boxes during system set up as described in Chapter 3. The default data box positions are along the bottom of the display. Each box can be moved to the desired position on the screen using the context-sensitive cursor.

To switch data boxes on and off as a group you need to go to Chart mode. Switching the databoxes on/off in Chart mode also affects their display in Sonar mode and vice-versa. You can switch them off and on individually using the System Set Up menu, as described in Section 3.3.

Changing the Scroll Speed

The standard fishfinder display is the scrolling bottom image. This is a graphical representation of the echoes seen by the sounder. New information appears at the right hand side of the display and scrolls to the left.

The speed at which the display scrolls is adjustable. As illustrated in Figure 4-7 , if you select a faster speed, more detail is displayed and is useful when you are looking for fish; if you select a slower speed the information remains on the display for longer.

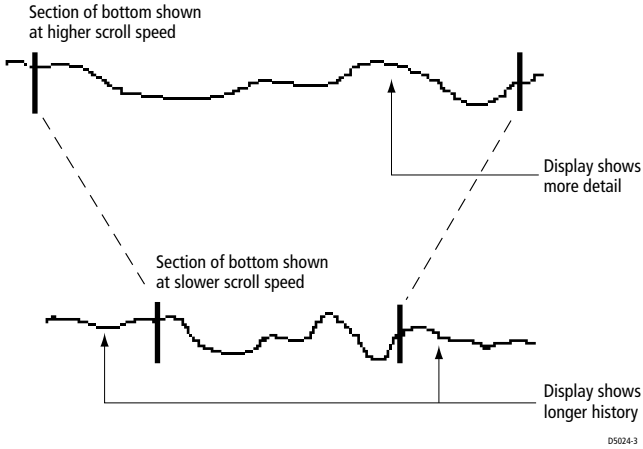


Figure 4-7: Effect of the Scroll Speed

The DSM300 defaults to manual scroll adjustment at full speed (100%). Use the trackpad to decrease the scroll speed in 10% increments down to 0% (pause). Unlike automatic adjustment, manual scroll speed is not related to boat speed over the bottom.

Or you can have the sounder automatically adjust the scroll speed, based on boat speed. If you select automatic adjustment, the scroll speed is related to boat speed as follows:

- Less than, or equal to 0.5 kts, scroll speed is constant at 10%
- Between 0.5–15 kts, scroll speed varies linearly with boat speed
- Greater than 15 kts, scroll speed is constant at 100%

You can also pause the display in either manual or automatic mode. The depth indication continues to be updated.

➤ To change the scroll speed:

1. Press **MENU**, then press the SCROLL SPEED soft key.
2. If necessary, press the SCROLL AUTO MAN soft key to toggle the setting between AUTO and MAN.

3. For manual adjustment, use the trackpad to change the scroll speed in 10% increments from 0 to 100%. You can press and hold the trackpad to change the value more rapidly.
4. Press **ENTER** to return to the Menu soft keys, then **ENTER** again to return to the default display.

➤ To pause the scrolling display:

1. Press **MENU**, then press the SCROLL SPEED soft key.
2. Press the PAUSE soft key. The display stops scrolling and the key is relabeled RESUME.

3. To resume scrolling, press the RESUME soft key. The key is relabeled PAUSE.
4. Press **ENTER** to return to the Menu soft keys, then **ENTER** again to return to the default display.

Selecting the Power Setting

The POWER soft key provides adjustment of the transducer signal. When AUTO is selected (default), the sounder automatically determines the optimal power setting based on the current depth, speed, and (bottom) signal strength. When AUTO is selected the current automatic power setting is indicated in the top status line by an L (low) or H (high).

If, however, you wish to manually adjust the power to suit current conditions, you can select either LO or HI power. LO power (100 W) is normally used in depth ranges less than 8 ft (2.4 m) and HI power (600 or 1000 W, depending on your transducer) is typically selected for depths greater than 12 ft (3.7 m).

➤ To change the power setting:

1. Press the **MULTI** key (**MULTI** knob on CRT radar units) to display the soft key controls.

2. Press the POWER soft key to toggle between AUTO, LO, or HI power. The selected setting is highlighted.
3. Press **ENTER** or **CLEAR** to return to the default screen.

Changing the Sounder Range

By default, the sounder automatically adjusts the display range, selecting the shallowest range that keeps the bottom in the lower half of the display window. Shift is disabled (the value is ignored) when auto-range is selected.

Alternatively, the **RANGE** key lets you select the maximum depth displayed on the scrolling bottom and A-Scope displays. You can also set the shift value to move the image window up or down within the current range.

The following range/shift values are available:

Table 4-2: Range and Shift Values

Feet		**Fathoms**		**Meters**	
Range	**Shift**	**Range**	**Shift**	**Range**	**Shift**
5	1	1	1	2	1
10	2	2	1	4	1
15	5	3	1	6	2
20	5	4	1	8	2
30	10	5	1	10	2
40	10	8	2	15	5
50	10	10	2	20	5
60	20	15	5	25	5
80	20	20	5	30	10
100	25	25	5	40	10
150	50	30	10	50	10
200	50	40	10	60	20
250	50	50	10	80	20
300	100	60	20	100	25
400	100	80	20	150	50
600	200	100	25	200	50
800	200	150	50	300	100
1000	250	200	50	400	100

Table 4-2: Range and Shift Values

Feet		Fathoms		Meters	
1500	500	250	50	500	100
2000	500	300	100	600	200
2500	500	400	100	800	200
3000	1000	500	100	1000	250
[1] 3500	875	600	150	1200	300
4000	1000	700	175	1400	350
4500	1500	750	250	1500	500
5000	1250	850	170	1700	425

[1] Depths greater than 3000 ft (1000 m) require a high performance transducer

➤ To adjust the range and shift values:

1. Press **RANGE**, this sets adjustment to manual and the range soft keys are displayed. The range adjusts up or down depending on the direction pressed.
2. Use the **RANGE** key to adjust the range: press the up arrow to select a shallower range, press the down arrow to select a deeper range.

3. If desired, press the RANGE AUTO MAN soft key to select AUTO range. AUTO range is indicated by the letter R in the status bar.
4. To adjust the shift, press the appropriate SHIFT soft key: use the up soft key to select a shallower shift, use the down soft key to select a deeper shift. The image window is shifted up by the selected amount. Pressing the SHIFT keys sets the range to MANUAL.
5. Press **ENTER** to return to the default display.

Selecting the Frequency

The DSM300 uses dual frequency sonar—50 kHz and 200 kHz—and can be used in either auto or manual modes.

The DSM300 can automatically select the appropriate frequency, based on the current display range. As the depth increases while in Auto Frequency mode, the sounder module shifts from 200 kHz to 50 kHz at 250 ft (80 m). As the depth decreases, the sounder module switches from 50 kHz to 200 kHz at 150 ft (50 m).

The Auto Frequency setting is also useful for automatically searching for bottom.

Alternatively, you can manually select either frequency, or both frequencies simultaneously (split frequency). Each is suitable for a particular purpose:

50 kHz Frequency

When using this frequency, the transducer scans a wide area. The 50 kHz signal penetrates water well, so is good for use in deep water.

200 kHz Frequency

When using this frequency, the transducer scans a narrower area, but produces a more detailed view. The 200 kHz signal is good for finding fish near the bottom or close together. It is better for use in shallow water.

Split Frequency

The transducer can operate in both 50 kHz and 200 kHz frequencies at the same time. If you choose split frequency operation, the scrolling bottom display is split horizontally; the upper half shows the 200 kHz detailed view and the lower half shows the 50 kHz image.

➤ To change the frequency:

FREQUENCY

1. Press the FREQUENCY soft key. The frequency selection soft keys are displayed.
2. Press the appropriate soft key – 50 KHZ, 200 KHZ or SPLIT. The scrolling bottom is displayed in the selected frequency.
   If you choose split, the scrolling bottom is displayed in both frequencies with 200 kHz in the upper window and 50 kHz in the lower window.
3. If desired, press the AUTO FREQUENCY soft key to set AUTO mode ON. AUTO frequency is indicated by the letter F in the status bar.
4. Press **ENTER** or **CLEAR** to return to the default display.

You can choose the split frequency display with the sonar display options, Bottom Lock, A-Scope, or Zoom.

Using Bottom Lock

The scrolling bottom display provides a top-down view, referenced from the surface of the water. Bottom Lock shows a water column of fixed height, referenced from the bottom, that appears flat. It removes bottom detail to provide an image of objects directly above the bottom and is useful when you are looking for fish that feed close to the bottom.

You can select the Bottom Lock image to be vertically split with the scrolling bottom display or it can replace the scrolling bottom display.

As illustrated in Figure 4-8 , the bottom is shown as a straight line. Note that some bottom features may extend above this line. The actual depth reading is given in the bottom left hand corner of the Bottom Lock display.

Range intervals on Bottom Lock are measured up from the bottom (rather than down from the surface). Thus, the bottom is shown as zero and the top number indicates the maximum distance above the bottom being displayed. You can adjust the Bottom Lock range.

If the A-Scope or Zoom image was displayed, selecting Bottom Lock automatically switches OFF A-Scope and Zoom.
If you have split frequency selected, the Bottom Lock image is displayed in both frequency windows.

If Target Depth ID is ON, the target depth is displayed as distance from the bottom. See "Target Depth ID" on page 35.

➤ To display the Bottom Lock image:

BTM.LOCK

1. Press the BTM. LOCK soft key. The Bottom Lock selection soft keys are displayed.
2. Press the BTM. LOCK OFF ON soft key to toggle the function ON.
3. Press the BTM. LOCK FULL SPLIT soft key to toggle between a full window bottom lock image or split windows. The bottom lock image is displayed. If you select split windows, the sounder display is split vertically, with the bottom lock image in the left hand window and the scrolling bottom display in the right hand window.

   In a split window display, a vertical bar appears (along the right hand edge of the scrolling bottom image) that references the range being displayed in the bottom lock window. This bar varies in height as the bottom lock range is changed.
4. To adjust the range, press the appropriate BTM LOCK RANGE soft key: press the up arrow to select a larger range, press the down arrow to select a smaller range.
5. Press **ENTER** or **CLEAR** to return to the default display.

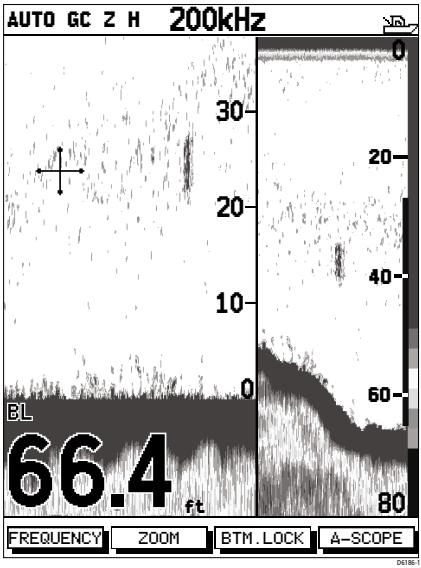


Figure 4-8: Bottom Lock Display with Split Windows

➤ To reposition the bottom lock image:

1. Use the trackpad to move the cursor to the bottom image until the text BL is displayed near the cursor.
2. Press **ENTER**, a horizontal line appears, indicating the cursor is active. Use the trackpad to move the line to the desired bottom lock image position.
3. Press **ENTER** to reposition the bottom lock image, or **CLEAR** to cancel the operation.

Using A-Scope

The scrolling bottom display provides a historical record of sonar echoes. Use the A-Scope screen to show raw sonar data directly from the transducer beam. This gives you a "real time" image of fish and bottom structure directly below the transducer. This function is very useful in showing the strength of the echo returned from a fish. At the lower end of the window, A-Scope also displays the patented Bottom Coverage width indication.

➤ To display the A-Scope image:

1. Press the A-SCOPE soft key. The display is split vertically, with the A-Scope image in the right hand window and the scrolling bottom image in the left hand window.

2. Press the A-SCOPE MODE soft key to select one of the three modes for A-Scope, as demonstrated in Figure 4-9 :
   i. Mode 1, in which the A-Scope image is angled outward as the signal width (indicated with dotted lines) increases with depth.
   ii. Mode 2, in which the image expands to take up the entire A-Scope window, providing greater resolution.
   iii. Mode 3, in which only the left hand side of the image displayed in Mode 2 expands to the entire A-Scope window. This mode provides the greatest resolution.
3. Press **ENTER** to accept your selection.

Note: *If the Bottom Lock or Zoom image is displayed, selecting A-Scope automatically switches OFF Bottom Lock and Zoom.*
If you have split frequency selected, the A-Scope image is displayed in both frequency windows.

➤ To remove the A-Scope image:

1. Press the A-SCOPE soft key.

2. Press the A-SCOPE ON OFF soft key to toggle off A-Scope.
3. Press **ENTER**.

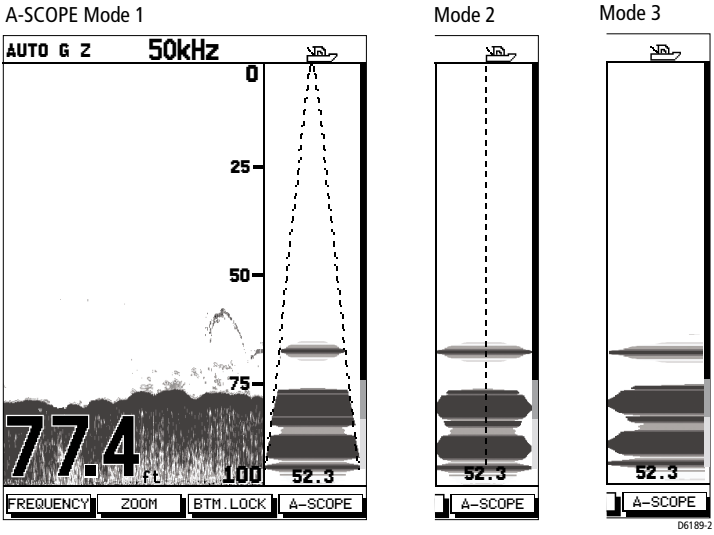


Figure 4-9: The Three Modes of A-Scope

Using Zoom

Zoom enlarges all or part of the scrolling bottom display. You can select automatic zoom so the sounder keeps the bottom in the lower half of the display window. Alternatively, you can manually pick the area to be zoomed.

➤ To select Zoom:

1. Press the ZOOM soft key.
2. Press the ZOOM ON OFF soft key to toggle zoom on.

3. Press the ZOOM FULL SPLT soft key to toggle between a full window zoom image or split windows.
   If you select split windows, the display is split vertically, with the zoom image in the left hand window and the scrolling bottom display in the right hand window. See Figure 4-10 .

   In a split window display, a vertical Zoom Range Bar appears (along the right hand edge of the scrolling bottom image) that marks the range being displayed in the zoom window. This bar varies in height with the selected zoom level. The depths of the upper and lower boundaries of the Zoom Range Bar are displayed in the upper and lower right corners of the Zoom window.

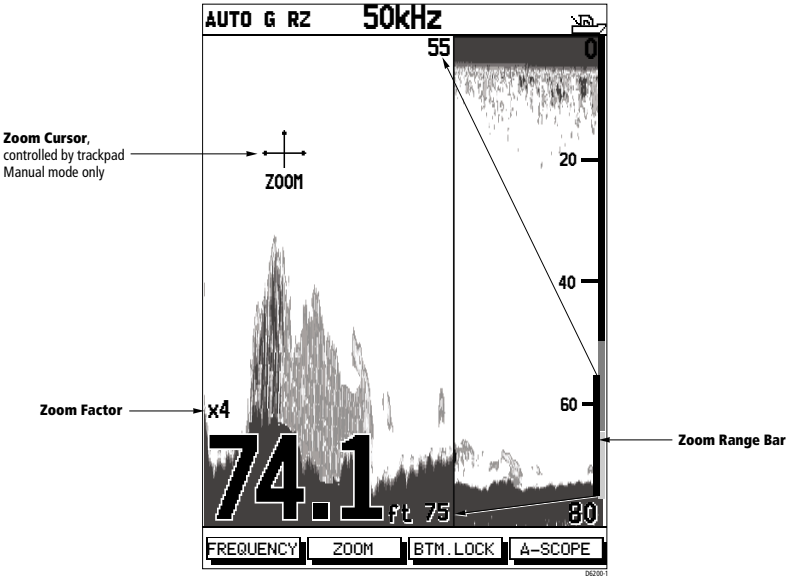


Figure 4-10: Zoom with Split Screen

4. Press the ZOOM AUTO MAN soft key to toggle the setting between AUTO and MAN. The automatic setting adjusts the position of the zoom window so that bottom details are always in view. The manual setting enables you to reposition the range of the zoomed image.

5. For zoom level selection, press the ZOOM X 2 4 6 soft key until the desired zoom level is selected. The greater the zoom, the smaller the area you are viewing, so the smaller the Zoom Range Bar.
6. Press **ENTER** or **CLEAR** to select.

➤ To turn off Zoom:

1. Press the ZOOM soft key.
   The Zoom soft keys are displayed.

2. Press the ZOOM ON OFF soft key to toggle zoom off.
3. Press **ENTER** or **CLEAR** to return to the default display.

If manual zoom is selected, you can reposition the area of the image that is zoomed.

➤ To reposition the zoom window:

1. If you have not already done so, make sure the unit is set to MANUAL zoom.
2. If the cursor is not already visible, press **ENTER** for the cursor to appear.
3. Use the trackpad to place the cursor in the zoom window. The text ZOOM is displayed near the cursor, as in Figure 4-10 .
4. Press **ENTER**. A horizontal Zoom Position Line appears, indicating the cursor is active. See Figure 4-11 .
5. Use the trackpad to move the Zoom Position Line up or down on the screen:
   Moving the line UP toward the surface moves the Zoom Window DOWN toward the bottom.
   Moving the Zoom Position Line DOWN moves the Zoom Window UP.

Note: *If you wish to move the window beyond what is displayed, you must move the Zoom Position Line to the edge of the window, press* **ENTER***, return the Zoom Position Line to the opposite edge of the window, and then repeat the process. You may need to do this several times.*

6. After you have moved the Zoom Position Line to the desired position, press **ENTER** to reposition the zoom image, or **CLEAR** to cancel the operation.

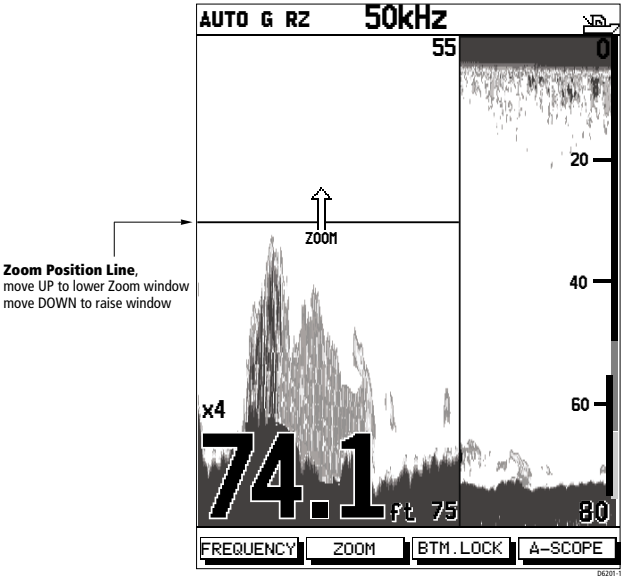


Figure 4-11: Repositioning the Zoom Window

Selecting Zoom automatically switches OFF Bottom Lock and A-Scope, if either of these images were being displayed.
If you have split frequency selected, the selected Zoom image is displayed in both frequency windows.

Notes: **(1)** *The vertical Zoom Range Bar shows the range being displayed in the zoom (left side) window.*

(2) *The size of this zoom range is determined by the zoom factor (2x, 4x or 6x).*

(3) *The position of the zoom range on the scrolling bottom (right side) window is determined by whether you are using automatic or manual zoom mode. AUTO positions the zoom range at the sea bottom.*
In MANUAL, the range is positioned by moving the Zoom Position Line with the trackpad.

Chapter 5: Sonar Mode Operation

5.1 Introduction

Basic operation, including a description of the different display options, was given in Chapter 4. This chapter explains how to use the display unit to show sonar data. It describes how to fine-tune the image and use the controls to get additional information.

Note: *This chapter describes using the DSM300 Digital Sounder Module with a Raymarine hsb² PLUS (Pathfinder) Series display. Instructions for operating the DSM300 with a C Series or E Series display are available in the handbooks for those products.*

This chapter covers the following topics:

- Interpreting and Adjusting the Sounder Image, including fish and bottom indications, using the white line feature and adjusting gain (sensitivity)
- Viewing Data Windows
- Setting up and Using Alarms for fish, shallow water and deep water
- Using a VRM to Determine Depth and Distance from Boat to a particular spot
- Placing Waypoints
- Using the Man Overboard (MOB) function

Note: *The settings described in this chapter are retained when the unit is powered off. However, there is a one-minute delay from the time you change the setting to when the DSM300 places it in memory. If you power down the sounder less than one minute after making a change, the setting is lost.*

Many of the parameters on the DSM300 have both manual and automatic modes. The automatic setting takes advantage the hardware's advanced digital technology. As a result, the sounder typically performs better in automatic mode than in manual. For better performance, Raymarine recommends that you select AUTO mode wherever it is an option.

5.2 Interpreting and Adjusting the Sounder Image

The DSM300 uses sound waves to find fish and show bottom structure. The transducer sends high-frequency sound waves into the water; these sound waves strike fish, the bottom, or other objects in the water and return as echoes. The DSM300 interprets these echoes to present an image of the fish and bottom.

The strength of echoes is indicated by different colors (or shades of gray in monochrome displays). You can use this information to determine the size of fish and the bottom structure. Other objects in the water, such as debris and air bubbles, also return echoes; these echoes are generally weaker than the fish or bottom echoes and produce background noise or clutter on the display.

The digital sounder provides controls to reduce the background noise and to adjust the way in which echoes of different strengths are displayed. The color displays also let you select the background color and remove the display colors for weaker echoes.

The sounder provides a White Line feature which helps to distinguish between the bottom and fish (or other objects such as weed) that are close to the bottom.

Target Indications

When the sounder detects a target echo such as a fish, it displays a representative image on the LCD. The shape and size of this image is influenced by a combination of factors:

Boat speed

The shape of the target changes along with your speed. Slower speeds return flatter, more horizontal images. As your boat's speed increases, the image will tend to thicken and arch slightly.

The depth of the target

The closer the target to the surface the larger the image on screen.

To display the depth of individual targets, switch on the TARGET DEPTH ID from the menu, as described on page 44.

The size of the target

The larger the target, the larger the return on the fishfinder display. The size of a fish target is however dependent upon the size of the fish's swim bladder rather than its overall size. This swim bladder will vary in size between different breeds of fish.

The frequency of the transducer

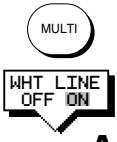
The same target will appear differently when the transducer frequency is changed. Generally, the lower the frequency the broader the image.

Using White Line

The White Line feature separates echoes from fish near the bottom and the bottom itself. When the White Line is switched on, the sounder displays the echoes differently.

On color LCDs, the strongest echoes are displayed in the background color with a thin line on top. All other echoes remain unchanged.

On monochrome displays, the weakest echoes continue to be displayed in the background color (white), but colors for the other signal are reversed. Thus, from the strongest to the second weakest the colors are: light gray with a thin black line on top, dark gray, black.

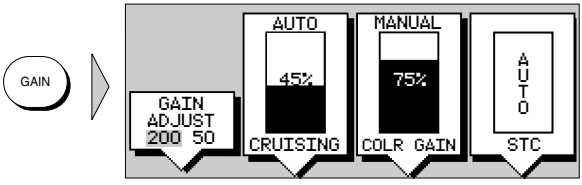


➤ To switch the white line feature on and off:

1. Press the **MULTI** key (knob). The WHT LINE soft key is displayed.
2. Press the WHT LINE soft key to toggle the white line feature ON or OFF.

Adjusting Display Gain (Sensitivity)

The sounder provides controls for GAIN, COLOR GAIN, and STC. These controls, accessed from the **GAIN** key (or **GAIN** knob on radar CRT units), are used to reduce background noise and determine how different strength echoes are shown. You can set automatic adjustment of each of these parameters or manually adjust the settings using the trackpad.



Note: *Automatic Gain settings take advantage the hardware's advanced digital technology. As a result, the sounder typically performs better in automatic mode than manual. For better performance Raymarine recommends selecting AUTO mode for all Gain options.*

If you change the settings, the new GAIN, COLOR GAIN, or STC values and mode (auto or manual) remain set even when you turn off the display.

You adjust gain for each transducer frequency independently. Press the GAIN ADJUST soft key to highlight the frequency for which you are making adjustments. You may change settings for one frequency while displaying the other.

➤ To adjust a parameter:

1. Press the **GAIN** key or rotate the **GAIN** knob on radar CRT units. The gain sliders are displayed. The slider last used is highlighted (displayed in inverse video) to show that it is selected.

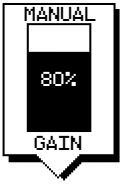
2. If necessary, press the GAIN ADJUST soft key to select the desired frequency for adjustment.
3. If necessary, press the desired soft key to highlight (select) the desired slider. Press it again, if necessary, to toggle between AUTO and MANUAL modes.
4. In manual mode, use the trackpad to move the selected slider up or down. You can press and hold the trackpad to move the slider quickly rather than in single steps.
   As you move the slider, the value displayed in the slider is updated. The new setting takes immediate effect.

Note: *Because the changes to the settings take effect immediately, you cannot revert to the previous settings by pressing* ***CLEAR****.*

5. When you have set all the controls to the levels you desire, press **ENTER** or **CLEAR** to return to the default display.

Gain

The GAIN, or sensitivity, of the display adjusts background noise by varying echo strength for display. The value of the gain control determines the strength above which echoes are displayed. If the gain is low only the strongest echoes are displayed. As the gain is increased, weaker echoes (from air bubbles, for example) are also displayed.

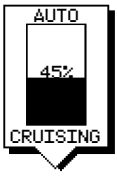


Pressing the GAIN soft key cycles the sounder from manual through three levels of automatic gain adjustment.

Manual gain should be set high enough to see fish and bottom detail but without too much background noise. Generally, a high gain is used in deep and/or clear water; a low gain in shallow and/or murky water.

The automatic gain modes finds the ideal sensitivity level for you, based on depth and water conditions. Automatic gain modes take advantage the hardware's advanced DSP technology. As a result, the sounder typically achieves a sharper image in any of the automatic gain modes than is possible in manual mode.

The DSM300 provides three pre-defined automatic gain settings:



CRUISING is the lowest automatic gain setting. It is ideal for viewing sonar image with a minimum of background noise as you are travelling to your fishing spot.

TROLLING is a slightly higher gain setting that displays more detailed echos as you search for targets.

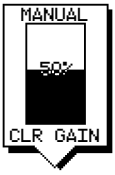
FISHING is the highest automatic gain setting. It gives the best details of the targets you have located but also displays the most background noise and surface clutter.

Note: *The automatic gain modes are named so as to suggest when you might use them. However, it is not necessary for you to select, for example, Fishing Mode only when you are fishing. You may want to take advantage of Fishing Mode's higher gain even when cruising at high speeds. Your personal preference should determine which automatic gain mode you use, not necessarily your boat speed.*

Color Gain

The COLOR GAIN determines how echoes of different strengths are displayed. Three shades of gray (monochrome display) or seven colors (color LCD) per palette are available and the echo strengths are divided into three (monochrome) or seven (color) bands to correspond with each shade of gray/color.

The color bar on the right hand side of the display, when set to ON in the Sonar Set Up menu (see Section 3.4), shows the colors being used, with strongest echo color at the top and the weakest echo color at the bottom.



The COLOR GAIN control sets the lower limit for the top color band:
All echoes with a signal strength above this value are displayed in the strongest shade/color.
All echoes weaker than this value are divided equally between the remaining shades/colors.

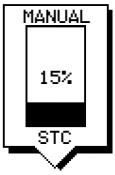
Setting a low value produces wide band for the weakest color, but a small signal band for the other colors; setting a high value gives a wide band for the strongest color, but a small signal band for the other colors.

Note: *On a color LCD, the sounder also provides a COLOR THRESHOLD control to reduce the number of colors displayed. Use COLOR THRESHOLD with COLOR GAIN to determine how echoes are displayed.*

The DSM300 provides automatic or manual COLOR GAIN adjustment. Automatic adjustment displays colors based on current conditions, with as many colors as possible, while minimizing noise and clutter. As conditions change the auto-color gain adjusts. If you select manual adjustment, you will need to re-adjust the gain as conditions change.

STC

STC (Sensitivity Time Control) reduces surface clutter by reducing the gain in the top 100 ft of the display. This function is useful for reducing noise (caused by air bubbles and floating debris) that often appears in shallow water. A low STC value has little effect on gain in shallow water; a high STC value decreases the gain in shallow water so that only the strongest echoes are displayed.



Although you can manually set the STC level, Raymarine recommends letting the sounder module choose the proper level for you by selecting AUTO STC. Automatic STC mode takes advantage the hardware's advanced DSP technology, which typically achieves a sharper image in auto mode than is possible in manual mode.

STC is not available in Sonar Simulator mode.

Using Alarms

The **ALARMS** key is used to set up alarms; three alarms are available to alert you of fish, shallow water, and deep water. Each alarm can be toggled ON and OFF and you set the depth at which shallow and deep water alarms are triggered: ranging from 2–3000 ft (or 2–4900 ft for high performance transducers).

You may want to use the shallow and deep water alarms when you are anchored. Set the limits to just above and below your anchor depth; the sounder triggers an alarm if the anchor drags and the boat moves into shallower or deeper water.

- Fish Alarm – If this alarm is ON the unit sounds a buzzer whenever it finds a fish. Different buzzer tones are used to indicate fish detected by the 50 kHz and 200 kHz frequencies.
- Shallow water – You set depth at which the shallow water alarm triggers. When the depth is less than that set, the buzzer sounds and a pop-up window describing the alarm is displayed. You cannot set the shallow alarm to be deeper than the deep alarm.
- Deep water – You set depth at which the deep water alarm triggers.When the depth is more than that set, the buzzer sounds and a pop-up window describing the alarm is displayed. You cannot set the deep alarm to be shallower than the shallow alarm.

Note: *The Deep Alarm must be set at a depth that is greater than the depth at which the Shallow Alarm is set. Conversely, the Shallow Alarm must be set at a depth that is less than the depth at which the Deep Alarm is set.*

After you have acknowledged the sounding of a shallow or deep water alarm, a minimum of 30 seconds must elapse before a another shallow/deep alarm can sound again.

The top line status bar shows the condition of the alarms:

- indicates an alarm is enabled. The speaker symbol is unfilled until an alarm is triggered and silenced, then the symbol is shown solid.
- S indicates the shallow alarm is enabled; a pop-up window indicates when the alarm is triggered.
- D indicates the deep alarm is enabled; a pop-up window indicates when the alarm is triggered.
- indicates the fish alarm is enabled.

External Alarms

All SeaTalk system alarms (except autopilot, shallow, and deep) alarms are received and displayed in Sonar mode. You can silence these alarms by pressing any key. No other action is taken except to silence the alarm.

➤ To set an alarm:

1. Press the **ALARMS** key. The alarms soft keys are displayed.

2. For the shallow or deep alarms, press the SHALLOW ALARM or DEEP ALARM soft key then use the up or down soft keys to change the alarm limit. Press the up arrow (right) soft key to select deeper water; press the down arrow (left) soft key to select shallower water.
3. If desired, press the ALARM OFF ON soft key to toggle the alarm on or off. If you turn the shallow or deep alarm off, its value is retained and will be used when you turn the alarm on again.
4. Press **ENTER** or **CLEAR** to save the changes and clear the list.

➤ To silence an alarm and clear the alarm message, press any key.

5.3 Using VRM

The **VRM** (variable range marker) key is used in Sonar mode to determine the depth and distance-behind-boat of an object on the display. The **VRM** function is available on the scrolling sonar display, bottom lock, and zoom windows.

A VRM is displayed as a cross hair with height and width of the display window. The center of the crosshair is the reference for which depth and distance-behind-boat are displayed. You can use the context-sensitive cursor to move the VRM over a particular object.

Depth is displayed, in the system units, on the right hand edge of horizontal line. In the scrolling sonar and zoom windows depth is measured from the surface down. In the bottom lock window, depth is measure from the bottom up.

Distance-behind-boat is displayed next to the vertical line, at the top of the window. The VRM distance units correspond to the depth units assigned in the system set up parameters you have assigned for your display unit, as follows:

System Depth Unit	VRM Distance Unit
Meters	meters
Feet	feet
Fathoms	feet

The distance-from-boat continues to update as your boat moves.

However, the vertical line does not scroll with the scrolling sonar image. If the display range changes, the VRM adjusts its relative position so that it does not move out of the visible display area.

When you switch on the VRM, it is displayed at its last position (unless off screen, in which case it is displayed on-screen).

If the sounder is in split frequency display mode or a zoom window is displayed with the scrolling sonar image, then the VRM is shown in both windows at the same position.
If bottom lock is displayed with the scrolling sonar image, the crosshair lines appear in bottom lock window but not in the scrolling sonar window.

➤ To switch the VRM on, or re-position an off-screen VRM:

1. Press **VRM/EBL**.
   The VRM is displayed in its last-used position.

The cursor is positioned at the center of the crosshair and has control of the VRM, as indicated by four-way arrow, the solid crosshair and the text VRM.

2. Use the trackpad to position the center of the crosshair over the desired object. The depth and distance-from-boat are updated as you move the cursor.
3. Press **ENTER** to drop the VRM. The crosshair is displayed as a dashed line.

➤ To move a VRM:

1. Move the cursor over the VRM you wish to change then press **ENTER**. The cursor is positioned at the center of the crosshair and has control of the VRM, as indicated by four-way arrow, the solid crosshair and the text VRM.
2. Use the trackpad to move the cursor and VRM to the desired position.
3. Press **ENTER** to drop the VRM, or **CLEAR** to abandon the operation and return the VRM to its previous position.

➤ To switch the VRM off:

Press **VRM/EBL**. The VRM is switched off.
—or—

Move the cursor over the VRM, until the text VRM appears, then press **CLEAR**.

5.4 Waypoints

The **MARKS** key lets you to place up to 998 waypoints. A waypoint is a position, normally entered on a chart as a reference, or as a place to go to. This section provides details that are specific to placing Waypoints in Sonar mode.

Note: *You can only place a waypoint in Sonar mode if you have valid position data from a GPS.*

A waypoint can be placed at the cursor position or at the boat's current position (this is sometimes known as an event mark); all waypoints placed on the sounder are stored in a waypoint database list with position, depth and temperature when it was placed.

Waypoints placed on the sounder are displayed as a solid vertical line on the scrolling bottom, Zoom and Bottom Lock displays. The waypoint number is shown at the top of the vertical line. The waypoint scrolls to the left with the scrolling bottom display.

If you place a waypoint at the cursor position in Sonar mode and a chart window is open, the waypoint is displayed on the chart. You can GOTO, EDIT and ERASE a cursor waypoint.

Note: *When in chart mode, if you place a waypoint at the cursor position, it is not shown on the display in Sonar mode.*

If you place a waypoint at the boat position in Sonar mode it is shown in the chart window.

Placing a Waypoint

➤ To access the place waypoint soft keys, press **MARKS**:

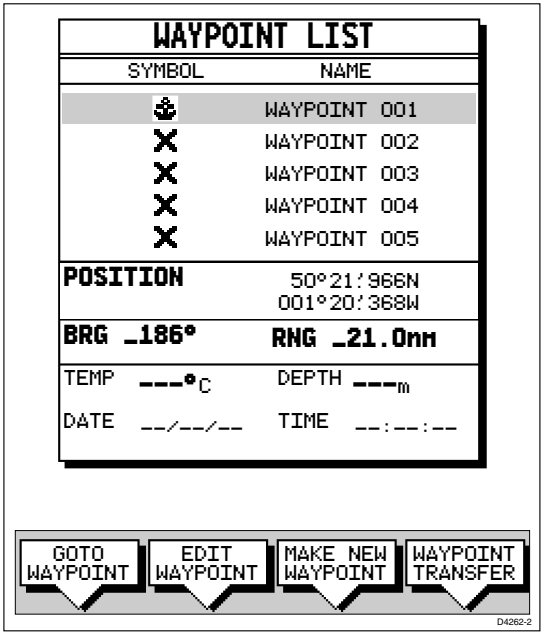
➤ To place a waypoint at the cursor position or at the vessel position:

1. Press either the PLACE WPT AT CURSOR or the PLACE WPT AT VESSEL soft key. The waypoint is added to the waypoint list and tagged using the next available number.
   The waypoint soft keys are displayed until you move the cursor away from the waypoint or press **CLEAR**.

   You can use the EDIT WAYPOINT soft key to name the waypoint as described in Editing Waypoints below.
2. Press **CLEAR** or **ENTER** to remove the place waypoint soft keys.

➤ To place a waypoint as latitude/longitude using the Waypoint List:

1. Press **MARKS**, followed by the WAYPOINT LIST soft key. The Waypoint List and associated soft keys are displayed.



2. Press the MAKE NEW WAYPOINT soft key followed by the LAT/LONG soft key; the WPT POSITION (LAT/LONG) screen is displayed, with it's associated soft keys. The waypoint is placed at the current vessel position, or if not available, the cursor position.
3. You can use the soft keys to edit the waypoint position.
   It is added to the Waypoint List and named with the next available number.

To return to the default soft key display, press **ENTER** or **CLEAR** twice.

For full details on working with waypoints, refer to the handbook for your display unit.

5.5 MOB

If you lose a person or object overboard and need to return to the location, you should use the Man Overboard (MOB) function. You can select the type of data used for the MOB position using the set up menus (see Section 3.3).

Note: *To obtain MOB position, you need either of the following:*

- Position data from a GPS or equivalent device
- Heading and speed data, so that the position can be calculated by dead reckoning

MARKS

➤ To initiate the MOB procedure, press and hold the **MARKS** key for two seconds. The system then performs the following tasks automatically:

- Marks the Sonar image with a vertical line and the letters MOB.
- Marks the current position on the chart display with a MOB symbol .
- Displays the MOB data box, showing the bearing and distance from your boat to the MOB waypoint position and the elapsed time since the MOB was initiated (Figure 5-1).
- Sounds a 4-second alarm pattern every 30 seconds.
- Sends an MOB message (including bearing and distance) to other units in the system, via the SeaTalk connection.

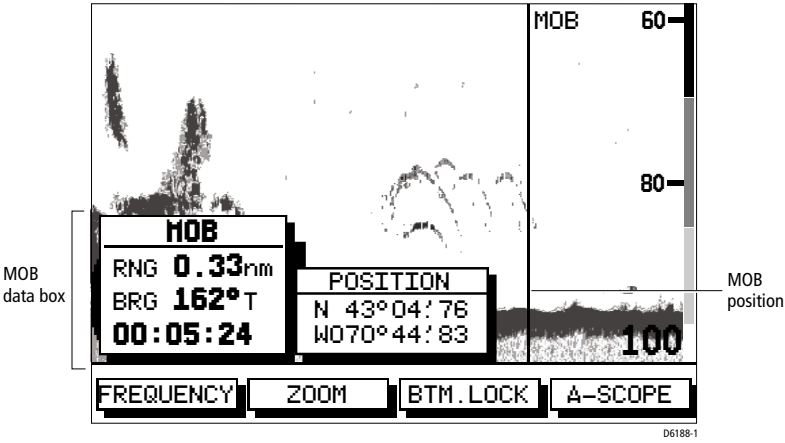


Figure 5-1: MOB Display

MARKS

➤ To cancel the MOB, press and hold the **MARKS** key for 2 seconds. The MOB symbol and data box are removed.

Note: *The MOB procedure can also be initiated or cancelled if the appropriate SeaTalk message is received by the display unit.*

Appendix A: List of Abbreviations

°C	Degrees Centigrade
°F	Degrees Farenheit
amp	Amperes
Auto	Automatic
CCFL	Cold Cathode Fluorescent Lamp
CDI	Course Deviation Indicator
COG	Course Over Ground
CPA	Closest Point of Approach
DC	Direct Current
DSC	Digital Selective Calling
DSM	Digital Sounder Module
EBL	Electronic Bearing Line
EMC	Electromagnetic Compatibility
FTC	Fast Time Constant
GPS	Global Positioning System
HDFI	High Definition Fish Imaging
KHz	Kilohertz

km	Kilometer
KPH	Kilometers per hour
ky	Kiloyards
LAT	Latitude
Long	Longitude
Man	Manual
MARPA	Mini Automatic Radar Plotting Aid
MPH	Miles per hour
nm	Nautical Mile
NMEA	National Marine Electronics Association
RTE	Route
s	seconds
SHM	Ships Heading Marker
sm	Statute Miles
SOG	Speed Over Ground
TCPA	Time to Closest Point of Approach
TTG	Time To Go
TVG	Time Variable Gain

UTC	Universal Time Constant
VMG	Velocity Made Good
VRM	Variable Range Marker
WPT	Waypoint
XTE	Cross Track Error

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